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THE RELEVANCE OF RECENT DEVELOPMENTS IN THE AREA OF TECHNOLOGY TO THE NEGOTIATIONS ON THE DRAFT INTERNATIONAL CODE OF CONDUCT ON THE TRANSFER OF TECHNOLOGY

Study by the UNCTAD secretariat

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Preface

The present study has been prepared in the context of consultations being held by the Secretary-General of UNCTAD and the President of the United Nations Conference on an International Code of Conduct on the Transfer of Technology to find solutions to the issues outstanding in the draft international code of conduct on the transfer of technology (see para. 11 below). On 9 February 1989, in a communication addressed to the co-ordinators of regional groups and China, the Secretary-General of UNCTAD indicated the way in which he, in collaboration with the President of the United Nations Conference on an International Code of Conduct on the Transfer of Technology, intended to proceed with further consultations on the draft code of conduct, including the practical steps to be taken in the framework of those consultations. These steps were as follows:

(i) The UNCTAD secretariat would prepare a study on the relevance of recent policy and legislative developments in the area of technology to the draft code of conduct, particularly the issues outstanding in the negotiations, and circulate it to Governments for comments;

(ii) Based on the outcome of (i), and with the assistance, where appropriate, of experts in the field of technology, the Secretary-General of UNCTAD and the President of the Conference would assess the situation and consider it in their consultations with regional groups and Governments;

(iii) The Secretary-General of UNCTAD would then make a report to the General Assembly based on (i) and (ii) to enable the General Assembly to take appropriate action on the negotiations on the draft code of conduct at its forty-fifth session.

Thus, the present study represents the first stage of the procedure suggested for the continuation of the consultative process. The study consists of three parts. Part one analyses the changes in firm strategies relating to the creation, application and transfer of technology. It addresses in particular the changes in strategies relating to R and D, industrial production, and technology appropriation and transfer. It also examines the changes in the channels and contractual forms of technology transfer, as well as the terms and conditions of such transfers.

Part two deals with the changes in government policies and legislation and analyses in particular recent legislative developments regarding intellectual property protection, the treatment of restrictive practices, and the question of choice of law in contractual arrangements. Part three focuses on the implications of the findings of the study for international technology transfer and their relevance to the negotiations on the code, and attempts at drawing conclusions from those findings.

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SUMMARY AND CONCLUSIONS

(i) Important changes in the area of technology have occurred since the start of the negotiations on the draft code of conduct, including changes both in the strategies of enterprises involved in creating and transferring technology and in the policies of their Governments. Developing countries' policies and approaches to the acquisition of foreign technologies have also substantially evolved. These changes have had, or are likely to have, a marked impact on international technology transfer and are hence of direct relevance to the negotiations on an international code of conduct on the transfer of technology.

(ii) Recent technological advances in such fields as informatics, telecommunications, biotechnology and new materials have greatly contributed to these changes. They have had a profound impact on almost all sectors of industrial activity and have deeply influenced the development of technology, as well as its application to the production of goods and services. To a large extent, such advances have occurred in the developed market-economy countries, resulting in a further widening of the technological gap between countries, in particular between the developed and the developing countries. More directly relevant to the code negotiations is the fact that these technological developments have also given rise to new methods of intellectual property protection, as well as to new practices in technology licensing.

(iii) These technological advances and their effects on international trade competitiveness have been major factors behind the initiatives of many enterprises in developed market-economy countries to greatly increase their R & D efforts, to reorganize industrial production, particularly through the use of information technology, and to participate in a wave of mergers, acquisitions and technological co-operation alliances, which has so far rarely extended to developing country enterprises. Meanwhile, the latter enterprises have fallen behind in their R & D investments for such reasons as the financial and economic problems experienced by most developing countries in recent years and the escalation in R & D costs. The resultant R & D gap could perhaps be compensated for by increased international transfers of technology. However, as shown in this study, the growing concentration and collaboration among allied enterprises in developed market-economy countries may, to the extent that it excludes enterprises from developing countries, result in a reduction, at least in the short term, of sources of supply of technology, particularly of new technologies for developing countries. It is also possible that, as a result of this trend, some industries will come to be dominated by competing transnational coalitions. This would further reinforce the bargaining power of technology suppliers, thus making it more difficult for technology acquirers, particularly in less technologically advanced countries, to obtain fair and equitable terms in technology transfer transactions.

(iv) Equally relevant to international technology transfer is the growing emphasis on the need for stronger protection of intellectual property rights and the increased resort to trade secrecy by technology creators and suppliers. The strategies of developed market-economy country enterprises in this respect have often received the support of their Governments both through national policy or legislative changes providing higher standards of protection domestically and through related international initiatives aimed at securing for them stronger protection worldwide. This has also coincided with a wave

of liberalization of controls on potentially anti-competitive practices in licensing agreements. Although the granting of higher standards of protection may be justified on grounds of providing incentives and securing investment returns for technology creators and innovators, other effects which may ensue from it, particularly in respect of international transfer and diffusion of technology, should not be overlooked. There is still ample evidence that intellectual property rights are often used, especially in developing countries, to maintain import monopolies rather than to work the technology locally or to license it to other enterprises. Moreover, stronger protection standards, coupled with reduced controls on anti-competitive practices, could give rise to higher royalties for technology transfer and a higher incidence of restrictive practices in licensing contracts.

(v) Thus, in establishing international rules which may enable technology owners to appropriate more effectively the fruits of their investments, it would be important not to lose sight of the corresponding need for international action on the "dynamic" aspects of such appropriation, so as to facilitate the transfer and diffusion of proprietary technology in the wider interests of both suppliers and potential recipients. This would entail the elaboration of international rules and principles aimed at promoting co-operation, both at the governmental and the enterprise level, in the diffusion and transfer of technology and at ensuring that stronger protection is not used to restrain competition, thus stifling technological innovation and undermining the very objectives for which it was granted. Such a framework of rules and principles would not only bring about a more balanced approach to international technological co-operation, making it easier for technology-acquiring countries to accept the granting of higher standards of protection but would also enhance the predictability and transparency needed for the free flow of technology among nations. Moreover, it would be indicative of a willingness not to exclude the interests of any group of States in the context of efforts to establish universally applicable norms and standards in the area of technology.

(vi) The efforts undertaken since the 1970s to formulate an international code of conduct on the transfer of technology constitute an attempt at establishing such a framework. However, in order to achieve such an objective, the negotiations on the draft code of conduct would need to take into account the relative shifts in concerns in the area of technology and of technology policies that have occurred since the inception of the negotiations. The nature and contents of the draft code of conduct reflected certain concerns and policy approaches at that time which, as shown in this study, have since then undergone important changes. At the same time, other needs and concerns have emerged in recent years. These include the pressures described in this study for a stronger protection of intellectual property rights, the growing collaboration among enterprises and between enterprises and Governments to promote technological innovation, the need to take advantage of opportunities for participation in strategic alliances in the field of technology, the increasing emphasis in the policies of developing countries on attracting foreign investments and promoting technology transfer, the relaxation of controls on restrictive practices in developed market-economy countries, the specific protection régimes and licensing practices relating to new technologies, the increasing concerns about the effects of technology upon the environment, health or safety, the shift in developing countries' technology policies towards advisory services and

assistance to local enterprises rather than the screening of technology transfer contracts, and the emerging opportunities for developing countries' participation in technological co-operative schemes and in joint ventures on research and development.

(vii) A global framework of rules and principles on the transfer of technology will have to reflect all these needs and concerns and, at the same time, provide for the normative flexibility and institutional follow-up necessary for the accommodation of further changes in a continuously shifting technological environment. The recent legislative and policy developments in the area of technology described in this study might henceforth facilitate the formulation of such rules and principles. Indeed, differences in conceptual approaches, which had in the past made it difficult to agree on common rules relating to certain aspects of international technology transfer, may have been narrowed down as a result of these developments. Recent international legal developments in related areas, such as foreign investment and intellectual property protection, could also contribute to facilitating future work on such a global framework.

INTRODUCTION

1. As explained in the preface, the present study was undertaken to examine the relevance to the code negotiations of the rapidly changing patterns of trade, production and innovation in the area of technology and the policy and legislative responses adopted by Governments in the light of these changes. Technological changes and developments abounded during the past two decades. Enterprises in developed market-economy countries were at the forefront of these developments. Accordingly, the OECD countries have been the first to adopt policy and legislative responses in respect of these technological changes. The study shows that these technological developments and the related changes in enterprise strategies and government policies have affected and continue to affect international technology transfers and are thus of great relevance to the negotiations on an international code of conduct on the transfer of technology.

A. Technological development and international technology transfer

2. Major technological advances have occurred over the last two decades in such fields as informatics, telecommunications, biotechnology and new materials. To a large extent, such advances have left most developing countries behind, resulting in a further widening of the technological gap between developed countries and developing countries. For example, of the patents registered in the United States between 1978 and 1984, less than 1 per cent were held by nationals of developing countries. 1/ Major reasons why developing countries have fallen behind are, on the one hand, the financial and economic problems most of them have experienced and, on the other hand, the escalation in R and D costs (although other macro-economic and structural deficiencies are also relevant). The steady growth in R and D efforts by developing countries during the 1970s and early 1980s has not been maintained. In Latin America, for instance, interviews undertaken in the context of this study confirm that the debt crisis led to sharp cuts in the R and D budgets of public institutes and universities, which undertake most R and D. The effects of the financial inadequacy of R and D in developing countries are made worse by the fact that R and D and innovation efforts undertaken in many developing countries have features that undermine their productivity for industrial purposes. 2/ Similarly, although the countries of Eastern Europe have devoted substantial resources to R and D and innovation activities, their relative technological position has declined because of the low speed of transmission of R and D output to the production sphere.

3. Moreover, the costs of generating technology have escalated. In the biotechnology area, for instance, it is estimated that the average cost of a new product, from research to market introduction, is $US 100 million. 3/ Two firms interviewed for this study indicated they were willing to spend up to $US 250 million per product. A telecommunications company stated that R and D costs per new switch were over $US 1 billion. Yet commercial life-cycles of products have shrunk, necessitating even more R and D; thus, the life of a switch had shrunk from 15 to 5-8 years. Governments and enterprises in developed market-economy countries have demonstrated a willingness to pay the price, even though they have evolved strategies to share these costs. Within the OECD countries, total R and D expenditure is estimated to have increased from approximately $US 154 billion in 1981 to $US 226 billion in 1985, with a very pronounced concentration in a few countries. 4/ Enterprises accounted for over half this expenditure. By way

of contrast, the total R and D spending of the top-spending 15 developing countries (for this purpose, Turkey has been included among the developing countries) accounted in the mid-1980s for only 5 per cent of the total in the 5 top-spending developed countries. 5/ In 1982, out of 64 countries about which there are data on R and D expenditure, developing countries accounted for only 4 per cent. The picture has probably worsened since then. The Republic of Korea, Singapore and Taiwan, Province of China, have targeted biotechnology research - yet their research budgets of around $US 10 million per year are negligible compared with an estimated $US 4.3 billion spent in the United States in 1987. 6/

4. Moreover, little R and D is undertaken in developing countries by transnational corporations (TNCs) as they usually prefer to undertake R and D in their home countries because of economies and synergies from centralization of research, availability of skilled personnel and concerns about secrecy or intellectual property. Thus, data from the last complete survey of United States-based transnationals indicates that, in 1982, 91 per cent of their research was done at home, and less than 1 per cent in developing countries. 7/ It is true that the percentage of R and D undertaken by some European TNCs in developing countries would appear to be much higher. But, in any event, with some exceptions, the R and D which TNCs undertake in developing countries is usually not very advanced - it mostly involves resource-based sectors, adaptation to local supply and marketing conditions, engineering to help local suppliers (because of local content rules), testing of drugs for regulatory approval, or field testing of agricultural inputs.

5. It is, of course, arguable that the R and D gap between some developed market-economy countries and other countries need not necessarily have adverse consequences, in that it relates mainly to "high-tech" sectors. However, the increasing use of advanced technology, particularly information technologies, even in relatively mature industries, would make it crucial for developing countries to generate or acquire such technologies. The R and D gap between countries would need to be compensated for by international transfer of technology. Yet there has been a slow-down in technology flows to most developing countries (although some developing countries have experienced increased flows). 8/ Meanwhile, the need for technology in developing countries has increased, in view of the economic and financial problems most of them have recently experienced, the reduced material-intensity of production (strengthening the need to find new end uses), and the increasingly decisive importance of technology to competitiveness in international trade. A number of efforts have in fact been made by Governments to attempt to reduce this gap between the need for and the availability of technology. It is an open question whether such efforts have been appropriate or adequate in the light of the changes that have occurred in technology and in enterprise behaviour. It would appear at any rate unlikely that significant progress in closing this gap could be achieved without concerted action by the international community. The efforts undertaken in the 1970s to formulate an international code of conduct on the transfer of technology constitute an attempt at such concerted action. Once adopted, the code of conduct would establish universally applicable principles and norms governing the relations amongst parties to technology transfer transactions and Governments concerned.

B. Evolution of the negotiations on an International Code of Conduct on the Transfer of Technology

6. Formal initiatives with a specific reference to the formulation of an international code of conduct on the transfer of technology started in 1972. 9/ However, the main impetus to the negotiations was provided by the General Assembly at its sixth special session, when it called for the formulation of an international code of conduct on the transfer of technology corresponding to the needs and conditions prevalent in developing countries (resolution 3202 (S-VI), section IV). At its seventh special session, it adopted by consensus resolution 3362 (S-VII), providing that all States should co-operate in evolving a code of conduct, corresponding, in particular, to the special needs of the developing countries. An UNCTAD intergovernmental group of experts was established for this purpose and held six sessions between November 1976 and 1978. Subsequently, by resolution 32/188 of December 1977, the General Assembly decided to convene a United Nations Conference on an International Code of Conduct on the Transfer of Technology under the auspices of UNCTAD to negotiate on the draft elaborated by the expert group, and to take all decisions necessary for its adoption. Since 1978, six sessions of the Conference have been held, 10/ the last of which was from 13 May to 5 June 1985.

7. The negotiations so far 11/ have led to a structure of the draft code consisting of a preamble and the following nine chapters: 1. Definitions and scope of application; 2. Objectives and principles; 3. National regulation of transfer of technology transactions; 4. Restrictive practices; 5. Responsibilities and obligations of parties to transfer of technology transactions; 6. Special treatment for developing countries; 7. International collaboration; 8. International institutional machinery; and 9. Applicable law and settlement of disputes. The substantive provisions of the code may be divided into those addressed to Governments (chapters 3, 6, 7 and 8); and those addressed to parties (chapters 4, 5 and 9). Most of the provisions of the draft code have been agreed upon, except a few issues to be found in chapters 4 and 9. 12/

8. With respect to chapter 4 of the draft code, there is a general understanding that it should consist of a chapeau and a list of specific practices to be avoided by parties to transfer of technology transactions. The drafting of clauses relating to 11 of these practices has been concluded, while the final formulation of 3 further clauses relating to grant-back provisions, export restrictions and restrictions after the termination of arrangements remains outstanding. The formulation of the chapeau poses the problem whether, and if so in which way, the following four aspects should be included in the code: (i) the characterization of the practices to be avoided and the circumstances under which they should be avoided; (ii) the criteria to be followed by parties or by competent authorities in the determination of whether a practice is restrictive or not for the purpose of the code; (iii) the applicability of chapter 4 provisions to the transfer of technology transactions between related parties (affiliated enterprises); and (iv) the relationship between the code provisions and applicable national or regional legislation.

9. The text of chapter 9 on applicable law and dispute settlement has not yet been formally drafted. However, the various texts considered during the negotiations consist of provisions dealing with choice of law, conciliation and arbitration. It appears that there is a broad consensus on the formulation of the provisions on conciliation and arbitration, but there are differences in the approaches proposed by regional groups with respect to the provision on the choice of law.

10. The other agreed draft texts still outstanding are the definition and underlying concept of the term "international transfer of technology transactions" in chapter 1, the scope and duration of confidentiality obligations in chapter 5, the nature of the institutional machinery to be established within UNCTAD to deal with certain provisions relating to the code, and the nature and mandate of the review Conference in chapter 8. For all these topics, compromise proposals have been submitted which seem to be close to resolving the outstanding questions.

11. Since the last session of the Conference, pursuant to General Assembly resolution 40/184 of 17 December 1985, followed by resolutions 41/166 of 5 December 1986 and 42/172 of 11 December 1987, decision 43/439 of 20 December 1988, and resolution 44/216 of 22 December 1989, the Secretary-General of UNCTAD and the President of the United Nations Conference on an International Code of Conduct on the Transfer of Technology have held consultations with regional groups and interested Governments with the objective of delineating the scope of the issues outstanding in the draft code and undertaking a quest for appropriate solutions. Significant efforts have been made by all regional groups and interested Governments to overcome the differences in their respective approaches to the issues outstanding in the code, in particular in chapters 4 and 9. However, despite all efforts, no concrete results enjoying general consensus have so far emerged. 13/ Indeed, these consultations have indicated that, although the formal status of the negotiations is as indicated above in paragraphs 7-10, the protracted duration of the negotiations has resulted in their being influenced by a number of factors in the external environment and has sometimes led to a questioning of some agreed provisions and even of the relevance of some other provisions. These factors in the external environment are discussed in the present study.

Part one

CHANGES IN FIRM STRATEGIES RELATING TO THE CREATION, APPLICATION AND TRANSFER OF TECHNOLOGY

Chapter I

STRATEGIES RELATING TO R AND D, ORGANIZATION OF INDUSTRIAL PRODUCTION AND MARKETING

12. Over the last two decades, changes have occurred in strategies and practices of many enterprises based in developed market-economy countries. These changes, while not directly related to technology transfer, significantly affect it. R and D, production, marketing and enterprise organization have all been strongly influenced by technological and commercial trends. Particularly in the chemicals, computers and telecommunications sectors, R and D expenditures have greatly increased due to the growing realization of the importance of innovation for competitiveness. Eight enterprises in these sectors interviewed in the context of this study confirmed this. They indicated that their R and D expenditure might, in some cases, go up to 15 per cent of turnover. Increasingly, therefore, R and D is considered as a "fixed cost" rather than as a "sunk cost" which can be amortized over the home-country market, leaving returns from foreign countries as a bonus. This has affected firm strategies relating to intellectual property protection and international transfer of technology. Moreover, although enterprises are undertaking more R and D "in-house", much is also being undertaken through collaborative links with other enterprises and universities (the latter because of the degree to which new technologies have become dependent on basic research and on extensive cross-fertilization of scientific disciplines).

13. The organization of industrial production has also changed, engendering important effects for international technology transfer. In many industries, there is less use of unskilled labour and more use of skilled labour and complex technology (although in some contexts information technology has made it possible to employ lower-skilled workers). There is also greater interaction among different technologies, design centres and systems engineering. Such changes in the organization of production have been influenced by the fact that the cost of the new flexible computer-controlled machinery is often higher than that of traditional single-purpose equipment. There is evidence that this high cost is discouraging the installation of the new machinery in developing countries, 14/ although some companies (mainly TNC affiliates) in a few developing countries are still installing it. 15/ The high cost of the new machinery is one factor among others which have led to a rise in the minimum economic scale (MES) of production in some industrial sectors (such as television manufacture). This is not, however, a universal trend; in some sectors, technological changes have reduced the cost of production equipment, thereby lowering MES. Moreover, despite its high cost, flexible machinery may itself lower MES because of the systemic gains from closer co-ordination, quicker delivery and lower inventories. In order to benefit from these advantages, however, enterprises have had to improve the organization of production and often to make more extensive use of outsourcing. This may be relatively more difficult for most developing country enterprises unless they are involved in strategic alliances with TNCs.

14. Enterprises have been induced to use flexible machinery by the fact that market requirements in developed market-economy countries (and a few higher-income developing countries) have changed, resulting in lesser emphasis on price and more emphasis on quality, product-differentiation, speed of response to changing tastes, and "bundling" of products and services. The latter point was brought out in interviews of two companies for this study - one of them supplies farmers with packages containing an optimum dosage (worked out by computer) of seeds, pesticides, herbicides, fertilizer and other inputs, while the other, dealing with water treatment, provides chemicals, instrumentation, on-site services, and centralized services. This trend towards greater "bundling" of products and services is arising from changes both in customer preferences and in technology itself. On the other hand, technological and organizational changes are making it easier to "un-bundle" the various stages of the value-added chain in the production of services. Meanwhile, the need to amortize greater R and D costs, often greater production costs, reduced commercial life-cycles and increased competition have necessitated speedy and extensive penetration of world markets, favouring firms with world-wide distribution and marketing networks and well established brand names.

15. The production, marketing and organizational changes discussed above have had or may have a differentiated impact on international technology transfer. There is as yet little indication (with some limited exceptions) of any significant relocation of existing production by transnational corporations away from developing countries because of the reduced importance of the cost of unskilled labour or in order to ensure better communications, closer co-ordination and speedier delivery, particularly in sub-contracting relationships. There is, however, some evidence that, during the 1980s, in their decisions where to site new production, transnational corporations in industries such as the automobile parts industry have tended to site in, or closer to, their home countries. 16/ This was supported by data obtained in an interview for this study of an American telecommunications company, which had preferred to set up a production affiliate in Mexico rather than in Malaysia. However, for another American company interviewed, which had set up a plant in Singapore, good communications and lack of customs delays outweighed the distance factor. In the long run, with the spread of ISDN (Integrated Services Digital Network) or EDI (Electronic Data Interchange), distance is likely to be a less important factor. In future, the trends relating to minimum economic scale (MES) in production and marketing would also further increase the incentive to transfer technology to those countries possessing large markets (particularly where there are barriers to those markets) and, on the whole, work against technology transfer to other countries; although the new flexible machinery (despite its higher cost) has reduced MES per batch of production, there is little evidence that transnationals are interested in adapting their production methods to smaller market requirements.

16. The increased cost of R and D and the changes in production and marketing have been important factors behind the wave of mergers and acquisitions in the developed market-economy countries in the 1980s (which has been favoured by the liberalization of competition law in these countries). Mergers and acquisitions are seen as a means of gaining access to the technology of the firm acquired, of realising economies of scale and scope, of creating the necessary revenue base for R and D activity, and of speedily penetrating world markets (improving both market access and distribution). 17/ Such advantages

have also led to the massive growth in developed market-economy countries of joint ventures and technological collaboration arrangements (or strategic alliances). For many enterprises, the limited and flexible nature of such ventures or arrangements may make them preferable to mergers. They also have other specific advantages such as the possibility they provide to conduct R and D jointly with universities or public sector agencies, to establish international technical standards for new technologies, and to make optimum use of the systemic advantages of flexible manufacturing. 18/ It may be noted that the interviews conducted for this study of eight chemical/pharmaceutical, computer and telecommunications companies support the above data; most of them had experienced increased collaboration and concentration in the 1980s because of the reasons indicated above.

17. Joint ventures and technological collaboration are particularly prevalent in high-technology sectors, perhaps because of the higher costs and greater risks inherent in these sectors. It is, in fact, possible that some high-technology industries will come to be dominated by competing transnational coalitions, which may treat developing country enterprises as "outsiders". Developing country enterprises have been virtually left out in the wave of mergers and acquisitions. Although it is more common for them to be involved in joint ventures or technological collaboration (such as sub-contracting arrangements), the number and scope of such arrangements is still relatively limited by comparison with what is happening in developed market-economy countries. There are, however, exceptions to this - electronic firms from the Republic of Korea are involved in a network of joint ventures and technological collaboration with American and Japanese enterprises.

Chapter II

STRATEGIES RELATING TO TECHNOLOGY APPROPRIATION AND TRANSFER

A. Technology appropriation concerns and suppliers' strategies

18. Increased technology-based global competition and mounting R and D costs have led enterprises in developed market-economy countries in a wide range of industries to regard the protection of their technological assets as crucial. Other relevant factors fuelling technology appropriation concerns have been the ease with which some new technologies or products resulting therefrom can be copied (technological developments may themselves facilitate such copying) and the inappropriateness of existing protection systems for the protection of new technologies. Patents and other methods of intellectual property protection have thus become important strategic and marketing assets (including in the context of cross-licences); this is the case particularly in the computer, semi-conductor, pharmaceutical, chemical and (to a lesser extent) petroleum, machinery and fabricated metal products industries. Even in these industries, however, and certainly in other industries where patents are less important, companies also rely for their competitive advantages on secrecy, know-how or know-why advantages (which are sometimes also trade secrets) and brand-name recognition. Accordingly, what seems to be important for firms is not intellectual property rights in isolation but the whole "package" of technological assets.

19. Particular importance is attached to trade secrets. A recent informal survey of licensing executives in Europe and the United States confirmed that, in 60 to 85 per cent of transfer transactions, there was a reliance upon trade secrets. 19/ Strict security precautions are therefore being taken to prevent loss of secrecy, and employees are being made to sign non-disclosure and non-competition agreements more often. 20/ The concern to maintain secrecy has also spread to universities, and has transcended the increasingly blurred border between technology and science, thus eroding the traditionally open character of scientific research and leading to a tendency to treat new scientific knowledge as proprietary information rather than as a "public good". 21/ In parallel with greater emphasis on secrecy, many enterprises, especially in the developed market-economy countries, are urging Governments to strengthen legal protection for technology. They have particularly expressed concerns about the protection standards and enforcement measures prevailing in developing countries. As a result, strong pressure has been applied upon Governments of many developing countries to adapt their protection régimes to the norms applied in developed countries. In Latin America, for example, foreign electronics or pharmaceuticals firms or industry associations have applied such pressure and have often been supported by their home-country Governments. Enterprises are also making greater efforts to protect their intellectual property rights by resort to litigation. Thus, the number of appeals heard by the Federal Court of Patent Appeals in the United States more than doubled between 1983 and 1988. 22/ Although litigation may be more prevalent in new technology areas where the boundaries of protection are not settled, it has also extended to relatively simple products, and huge sums are sometimes being claimed.

20. Furthermore, enterprises are increasingly undertaking systematic enforcement action aimed at deterring infringement of their intellectual property rights, either through unauthorized imitation or use or through

unauthorized marketing of products made under licence. In several Latin American countries, for example, foreign companies and local associations of software distributors have launched campaigns to enforce copyright protection or to obtain judicial decisions that clarify the legal norms for the protection of software. In Chile, large enterprises using copied software are being sued, in accordance with a strategy which has also been employed in developed countries. In Brazil, it is estimated that an enforcement campaign has succeeded in reducing the ratio of unauthorized to authorized copies of computer programmes from 10 to 1 to 7 to 1. 23/ In some Asian countries, some American firms have pursued court cases against local infringers soon after the countries concerned had strengthened protection (following bilateral discussions with the United States Government).

21. Technology suppliers' concerns about keeping control of their technology have also had a marked impact on their transfer strategies, which have become more selective and cautious. This has sometimes manifested itself in reluctance to transfer advanced technologies to unrelated enterprises. Some companies have established "in-house" screening mechanisms to prevent the transfer of technologies which are significant for long-term competitiveness. In the Dynamic Random Access Memory (DRAM) integrated circuit industry, for example, inter-firm licensing and joint ventures have declined since the early 1980s, even though product cycles have shrunk. 24/ There are problems in particular with transfers to enterprises in some Asian countries. One firm in the Republic of Korea, for example, had great difficulty in obtaining magnetron technology for microwaves, as there were only three firms possessing this technology at that time, and it only eventually obtained the technology from one of these firms because the latter was going bankrupt. 25/ Often, only part of the technology will be transferred. The most advanced part of it will remain under the control of the supplier, not even being trusted to a fully owned subsidiary. In a software licence, for example, the source code will not be transmitted, and the object code will often only be released in stages. In the petroleum sector, enterprises will not transfer their technology for oil prospecting, but will provide technical services and lease their equipment, whose ownership and use will stay in their hands.

22. However, this reluctance to transfer technology is more prevalent in high-technology areas and is not necessarily directed indiscriminately at enterprises from all countries. It is difficult to find signs of it in Latin America, for instance; the transfer of electronics to Brazilian firms has increased in line with the growth in that sector. 26/ In general, holders of technology remain willing to transfer it. In fact, the incentive to transfer has been strengthened, particularly for smaller firms, by the steep rise in costs and shorter commercial lives. Moreover, within coalitions of allied companies, there is probably more technology transfer than before, in order to achieve the systemic advantages of strategic alliances. However, suppliers place a greater importance on structuring the transfer arrangement in such a way as to reduce the risk to their competitive positions, as well as on the legal protection of their technology.

B. Technology acquirers' strategies

23. The strategies of some technology-acquiring enterprises have also evolved in recent years. As noted above, many enterprises from developed market-economy countries are using mergers, acquisitions and collaborative arrangements as a means of acquiring technology. In the countries of

Eastern Europe, the increased autonomy of enterprises has led to their largely replacing foreign trade organizations as the main technology acquirers (thus greatly increasing the number of acquirers). Since financing in most Eastern European countries is now the responsibility of individual enterprises rather than that of the Government, enterprises are more concerned with the economic efficiency of technology transfer transactions (and less with acquiring the most advanced technology available), have scaled down the size of individual transactions (by around a tenth in some countries), and are more ready to consider equity ventures.

24. In many developing countries, a significant learning process has taken place. Many enterprises have acquired a capacity to better negotiate the terms and conditions of technology transfer contracts, partly because of improved co-operation with the competent governmental authorities. In some Asian countries, large enterprises (including public enterprises) which have been buyers in the technology market for a long time have also often learned to search for alternative sources of technology and to participate in joint ventures. Meanwhile, in most of these countries, there is also a much larger number of small and medium-sized enterprises (SMEs) which have become buyers on the international technology market and which are capable of using the technology thus acquired. Recipient enterprises have also become more sensitive to the importance of personnel training, including training overseas, and have often found suppliers to be co-operative in this respect. In general, enterprises in some developing countries appear to be shifting their objective in technology transfer transactions from the mere acquisition of technical knowledge to the acquisition of the capability to master a technology. Given this more ambitious objective, and given the increasing complexity of technology being transferred, these enterprises have become more interested in closer co-operation and long-term relationships with technology suppliers (which are, on their side, also more interested in forging long-term strategic alliances). Thus, there seems to be developing, in many cases, a greater understanding between suppliers and acquirers of each other's point of view. However, it is difficult to estimate the extent to which these trends are prevalent in all developing countries, particularly least developed countries.

Chapter III

CHANNELS AND CONTRACTUAL FORMS FOR TECHNOLOGY TRANSFER

25. An examination of the changes relating to channels and contractual forms for technology transfer over the last two decades confirms that there is an evolution towards channels and forms which involve closer co-operation and involvement between supplying and acquiring parties, greater dependence of the latter on the former, and lesser expense on the part of the acquirer. There is thus increased resort to transfer arrangements involving the equity participation of the supplier. Another illustration of this trend is the evolution in arrangements for the installation of plant and equipment from the turn-key contract to ever more elaborate contractual forms requiring continuing involvement of the supplier. In general, acquiring enterprises and countries are less concerned with attempting to obtain different technologies for individual projects in an "unpackaged" form in order to possibly obtain cheaper prices. The emphasis now is on the obtention of as complete a package as possible, to ensure efficient transfer and absorption. There is, in fact, an increasing demand for technical services, both in isolation and in conjunction with other channels, in order to better assimilate and manage "hard" technology. This emphasis fits in with the interest of suppliers in providing "bundles" of technologies and services, although a few firms have also tried to cater to acquirers preferring unpackaged technology by establishing technology marketing groups to disaggregate and sell separate technologies. On the whole, however, the trend is towards more use of different channels and forms in conjunction with each other (so that the border line separating them has become increasingly blurred) and lesser use of "pure forms" of technology transfer such as vertical arms-length licensing.

26. Traditionally, the main channel for technology transfer was through fully owned subsidiaries of TNCs, as this allows transnationals to maximize rents and minimize transaction costs in relation to firm-specific intangible technological assets (such as know-how or product differentiation) and to avoid loss of control over the technology. Such considerations no doubt account for the rise, between 1977 and 1982, in the relative proportion of fully owned subsidiaries (in relation to 50 per cent-owned or minority subsidiaries) of United States-based TNCs. 27/ However, the foreign investment régimes in many countries imposed prohibitions or restrictions on the establishment of such subsidiaries. While most of these régimes have now been liberalized, fears about loss of control of technology have increased in recent years, making companies increasingly reluctant to transfer their "strategic" technologies outside their network of wholly owned affiliates. Yet, despite these factors, other channels and forms of transfer to developing countries such as joint ventures have gained in importance in recent years, although their use may well be limited to transfer of technologies which are not avant garde or within the core competence of companies. This has happened mainly because of economic risks associated with operations in an unfamiliar environment, the limited importance of individual markets, the greater involvement of non-TNCs in technology transfer, and the opportunity to take advantage of a local firm's market entry and knowledge advantages.

27. Thus, one chemicals company interviewed for this study had reduced its wholly owned operation in Malaysia to 50 per cent-ownership because its local partners gave it an entry into the palm oil business and it considered half of a profitable business was better than the whole of a mediocre one. However,

the possibility of competitive threat is usually carefully assessed when suppliers wish to establish joint ventures. Thus, a French multinational chemical company interviewed for this study was prepared to establish, for market access reasons, production joint ventures in two Asian countries only because in one case, the local partner was small while, in the other case, it was possible to take stringent confidentiality precautions. Compared with technology transfer to independent parties, joint ventures allow suppliers to ensure the technology is used properly and to maintain a large degree of control over the management of the venture and the technology.

28. Acquirers have also favoured joint ventures because they have ensured stronger commitment by the supplier to the success of the arrangement, better absorption by the acquirer (assuming he has already some technological capacity) and better access to improvements to the technology and to export markets. A case in point is a three-way joint venture in Singapore associating local parties which provide the production base and access to government incentives, a small American company which provides the technical know-how, and a larger one which provides market access and distribution in the United States. In the countries of Eastern Europe, the growth rate of joint ventures has been very fast since the beginning of the 1980s. At the beginning of 1989, there were over 1,200 companies with foreign capital participation located in the countries of Eastern Europe, 28/ and there appears to have been a particularly sharp growth in 1989. 29/ So far, most of the joint ventures operating in the countries of Eastern Europe are operating in manufacturing and services (other than financial services), but investment in some countries is concentrated in traditional industries. 30/ Thus, while joint ventures are having a substantial impact by bringing in new capital and by modernizing the economies of the Eastern European countries, their contribution to technology transfer may not be quite as substantial. Even in the USSR, where a relatively high proportion of joint ventures has so far been located in manufacturing, there are indications of dissatisfaction by the competent authorities with some of the more recent joint ventures because of their small size, the high concentration in trading and consultancy services, the non-transfer of advanced technologies, and the low start-up rate. 31/ Joint ventures are also much used by enterprises from Eastern Europe in technology transfer to developing country enterprises.

29. Other types of equity links (other than joint ventures) between technology suppliers and recipients are increasing. In developed market-economy countries, it often happens that companies take minority stakes and/or cross share holdings in each other in the context of technological co-operation. It is also increasingly common for licensors, when they license technology they are actively using, to take an equity stake in the licensee in order to better control the use of the technology. These trends are likely to extend to enterprises in some of the more advanced developing countries. Closer involvement between suppliers and recipients is also likely to follow from growth in non-equity collaboration agreements, which are often favoured because they are less elaborate in structure and more flexible than equity joint ventures. Suppliers may also favour them because the lack of equity stake may mean that they have a lesser commitment to the success of the collaboration, particularly as most of these arrangements carry the implication that the local party will assume most of the risks of project failure.

30. On the other hand, a number of factors are contributing to a decrease in the relative importance of vertical licensing between independent parties as a channel for technology transfer. Such licenses have always been of limited relevance to least developed countries (LDCs) because, by their very nature, they are used for the transfer of relatively advanced technology, because the mere permission to use an intellectual property right does not confer technical knowledge, and because the licensee has to bear the full cost of creating the production facility himself. The growing complexity of technology and shortages of finance now decrease the relevance of such licensing for most developing countries. Similarly, in the countries of Eastern Europe, the available data would indicate that imports of licences have remained stagnant in most countries between the 1970s and late 1980s. Other factors which have probably decreased licensing between independent parties are licensors' increased concern with confidentiality and protection of intellectual property, and the liberalization of régimes governing foreign investment or joint ventures. More and more, arms-length licensing is limited to transactions between large industrial groups of comparable technological level (particularly when the recipient is a public enterprise) and transfer of simple technology between SMEs. A survey of technology suppliers in OECD countries also confirms that licensing is now not increasing as fast as other forms of transfer. 32/

31. Turn-key contracts were favoured in many developing countries in the past because of the relative freedom they afforded from contractual restrictions by the supplier, and a large number of such projects have been executed. Factors which have contributed to the success of some projects include the thoroughness of feasibility studies, the maturity of the technology transferred, adequate training, the linkage of production units with local R and D or engineering centres, the small scale of projects (at least in the initial phase), or the attention paid to the elaboration or follow-up of contracts. Moreover, where the acquirer has a high level of technological ability, his personnel have been able to observe the plant being built up from scratch and learn therefrom. Thus, the initial build-up of technological capacity by enterprises from the Republic of Korea was almost exclusively on the basis of turn-key projects. However, the experience of the Republic of Korea shows that as the technology to be acquired became more advanced, turn-key projects became less appropriate as compared with licensing, while it was difficult to acquire the most advanced technologies without resort to joint ventures or wholly owned FDI. 33/ Moreover, in many cases, turn-key projects have had a poor success record, because of such factors as the parties' failure to make thorough feasibility studies or to take local conditions into account; the lack of competence, reliability or financial stability of the supplier; inadequate guarantee and liability clauses in the contract; or inadequate checking or monitoring by the acquirer. These reasons have sometimes arisen from the disinterest of the supplier in the commercial success of the operation, and deficiencies in the procedures and/or bargaining power of the governmental authorities or state enterprises which usually commission these projects.

32. Some contractual extensions of the turn-key contract, such as the product-in-hand or quality-in-hand contracts, have therefore been used. 34/ These usually have a stronger service content and involve greater reliance on the supplier. Given the expense, and the often difficult experiences of many developing countries with contracts relating to industrial installation, some developing countries have also tried to strengthen the commercial interest of

the technology supplier in the undertaking by encouraging him to take an equity stake. However, such a combination of turn-key project and joint venture has not yielded good results, especially in those cases where the local party did not have enough technological capacity, as has often been the case in some African countries. Although turn-key projects cum joint ventures are still common in African countries, there is now a relative return to wholly owned foreign direct investment. Experience, as well as financial problems, have led to an emphasis on down-scaling of projects, on rehabilitation of earlier projects which had failed, and on technical services and personnel training. In developing countries as a whole, the expense of purchasing and installing machinery equipment has led to a decline in the importation of capital goods by many countries during the 1980s. Future trends are likely to depend upon the financial situation of individual countries. Rather than outright purchase of machinery, there may be greater resort in some developing countries to leasing operations. These have already sharply increased in Eastern Europe (often in connection with buy-back arrangements).

33. All the above channels and forms of technology transfer increasingly involve the provision of technical services, as the importance of the "human element" to the success of the transfer is being realized. Yet experience has shown that sometimes the supplier may not provide services sufficient to ensure a "real" transfer of technology. This has led to more acquisition of technical services from independent suppliers in some countries, while in some more advanced Asian and Latin American countries there has been a reduction in the use of contracts relating only to provision of technical service, in line with growth in domestic capabilities. Know-how transmission contracts increasingly relate not just to specific industrial processes but to the organization of production and the attainment of technical and commercial mastery. Training contracts are still much less common than training obligations in connection with other types of technology transfer contracts. Given the deficiencies sometimes occurring in the execution of the latter, however, and given the emergence of new and more complex technologies, isolated training contracts are likely to assume greater importance. Management contracts are also likely to become more important as it becomes more difficult to organize complex industrial processes and global marketing strategies. Consultancy contracts are widely used and have been particularly useful in Africa for the purpose of rehabilitating industrial plants or in agro-industry.

Chapter IV

TERMS AND CONDITIONS OF TECHNOLOGY TRANSFER

A. Transparency and confidentiality

34. Transparency in technology transactions may have improved in recent years. Apart from specific problems relating to confidentiality, contractual descriptions of the technology being transferred to enterprises in some developing countries (mainly some Asian countries) are becoming ever more precise and detailed. More documentation is being provided, and there appears to be greater itemization of different types of technology supplied, although there is much room for improvement with respect to the precision of description of technical services. Problems have arisen in certain cases, however, because of the non-provision of relevant information by either party to each other, both during the pre-contractual negotiations and while the contract is being executed. Sometimes acquiring parties or governmental authorities have failed to disclose information on local constraints, while supplying parties have often avoided disclosing technological or commercial information which might adversely affect the sale of their technology.

35. Confidentiality is considered of primordial importance by technology suppliers, particularly in respect of transfer of new technologies. In some Asian countries, suppliers' concerns about confidentiality often lead them to disclose little detail about their technology in pre-contractual negotiations. These problems, taken together with the rise in the importance of trade secrets and the trend towards new forms of protection involving reduced or no disclosure, obviously have a bearing on the adequacy of the description of technology provided in licences of such intellectual property or trade secrets. It also makes it that much more difficult for recipient enterprises or countries (particularly given the deficiencies in their systems of examination of patent applications) to verify a supplier's representation that he has a right to the technology licensed. This is a problem that may get worse because it is often difficult to identify the creator of a new technology. The provision of relevant information and adequate description is also linked to the concern by acquiring countries that technology imports should be useful or advanced. However, legislative or contractual provisions to this effect may be of limited use in the absence of the ability to verify that they have been observed.

36. In some cases, suppliers insist not only upon the assumption of confidentiality obligations by recipient enterprises, but often upon additional personal confidentiality guarantees by the latter's key personnel. There is also often a strict delimitation in the contract of the conditions under which the technology is to be used, such as the limitation of the points of production or sale. Inspection visits are provided to enforce these conditions, while any repairs or maintenance may have to be undertaken by the supplier. The question of confidentiality has turned out to be particularly crucial in R and D collaboration contracts, in which the parties are usually bound to communicate to each other all the information they may have which may facilitate the execution of the contract, including both information existing at the time of the agreement and that acquired during its execution.

B. Payments and guarantees

37. On the question of payments, there is some limited evidence that royalty rates and payments for technology services may have become slightly higher in recent years, although this is probably more the case in respect of transfer of new technologies. Thus, certain telecommunications and computer companies, which used to license their technology for 1 per cent of gross sales a decade ago, recently indicated they now demand up to 5 per cent. 35/ In the pharmaceuticals/biotechnology area, there are reported to have been licences with royalties of over 10 per cent. Out of a sample of eight companies interviewed for this study (operating mainly in the chemical, pharmaceutical, telecommunications and power plant industries), under half reported slightly higher royalty rates compared with a decade ago, while none reported lower payments. Further research would need to be carried out on this subject before definitive conclusions can be drawn. Future trends are difficult to predict, but stronger protection for technology, liberalization of competition rules and a concentration of technology sources may well lead to higher payments.

38. The question of guarantees is very much linked to that of prices. Experiences in some developing countries have shown that the more the acquirer insists upon extensive guarantees, particularly in contracts for the installation and operation of plant and equipment, the more likely the supplier has been to raise the price; to "over-design" the plant, to install capital-intensive plant, and to reduce the use of local personnel; to insist upon exception clauses limiting responsibility in the event, for example, of normal wear and tear and negligence, lack of training or lack of maintenance by the acquirer's personnel; and to limit liability in respect of the duration of the guarantee, the number of interventions to set things right, damages caused indirectly and, in particular, monetary ceilings. On the other hand, it has often happened that the supplier, when dealing with inexperienced acquirers, has taken such precautions to limit risks or liability, but without providing a quid pro quo in terms of reduced price. Particular problems have arisen with the supply of technical services, either in isolation or in conjunction with other channels or forms of transfer, though it has proved difficult to establish whether the inadequate execution of the contract has arisen because of the supplier's or the acquirer's behaviour and capacities. In an attempt to remedy this, contracts have sometimes referred to the rules of professional practice established for suppliers of some technical services.

39. The above-mentioned difficulties with respect to some guarantees have reinforced the importance of other guarantees relating to provision of training, accessories, spare parts and components and to access to improvements. On the latter question, problems have not usually arisen with the principle of granting such access, but the scope of the improvements falling under such provisions has often given rise to different interpretations. Acquiring enterprises have considered that access should not be narrowly limited to improvements to the specific technology transferred, but should also apply to improvements within an integrated complex of technologies. Suppliers have not accepted this, particularly when they themselves are licensing in some of the technologies in the complex. A solution to this issue has been found if there is a long-term relationship between the parties, and mutual trust has been built up. Table 1 below shows the problems in selected developing countries with respect to lack of guarantees by suppliers.

Table 1

Contractual terms in selected countries

	Brazil	Nigeria	Rep. of Korea
Time period	1984-1985	Approx. 1983-1987	1980
Sample No. of contracts	257	640	200
Lack of guarantees No. of contracts % of contracts	 50 19.4%	 268 42%	 No data available
Non-reciprocal grant-back No. of contracts % of contracts	 30 11.7%	 25 4%	 No data available
Tying clauses No. of contracts % of contracts	 No data available	 32 5%	 33 8%
Export restrictions/ limitations No. of contracts % of contracts	 36 14%	 192 30%	 86 43%
Restrictions after expiration of arrangement No. of contracts % of contracts	 45 17.5%	 No data available	 No data available
Applicability of foreign law and/or jurisdiction No. of contracts % of contracts	 46 17.5%	 256 40%	 No data available

Sources: Case study on the implementation of technology transfer legislation in Brazil, prepared for the UNCTAD secretariat by Arthur Cardozo (to be published soon); "Technology transfer and joint ventures: The Nigerian experience" by A. Adeoba, in "Joint ventures as a channel for the transfer of technology" (UNCTAD/ITP/TEC/9); and "The implementation of laws and regulations on transfer of technology - The experience of the Republic of Korea" (UNCTAD/ITP/TEC/6), prepared by the UNCTAD secretariat in collaboration with Mr. Jinjoo Lee.

C. Restrictive practices

40. The prevalence of some restrictive practices and of clauses providing for the applicability of foreign law or jurisdiction are also demonstrated in the table. It should be noted that only some of the restrictive practices present in contractual transactions have been covered in this table and that the data provided relate to practices contained in contracts before the intervention of the competent authorities. The table clearly indicates the importance attached by technology suppliers to export restrictions or limitations. This is supported by other data. A survey of licensor firms in OECD countries found that 72 per cent considered export limitations to be a very important aspect of licensing agreements, while 67 per cent considered exclusivity provisions (relating to sub-licensing and exclusive dealing sales or representation), and nearly 45 per cent considered market limitations (field of use or field of sale) also to be very important. 36/ Another survey of suppliers confirms the paramount importance of territorial restrictions to licensors - over 80 per cent of those surveyed sought to insert such restrictions in contracts. 37/ In software licences, suppliers tend to impose broad restrictions of use, secrecy and non-disclosure clauses, while suppliers of biotechnology emphasize field of use and no-competition restrictions. All this data would confirm suppliers' extreme sensitivity to potential competition by acquirers or other parties.

41. Yet, despite this sensitivity, personnel in some technology transfer registries in Latin America interviewed in the context of the present study had the impression that, in technology transfer to Latin American enterprises, the number of restrictive clauses and their degree of restrictiveness had been reduced in recent years. This was ascribed to the learning process that had taken place in local enterprises. This assessment should, of course, be viewed in the context of the liberalization of government controls of such practices. But data from Poland also indicates that there has been a decrease in "restrictiveness" in respect of both technology imports and exports. 38/ In technology importation contracts, a comparison of the periods 1970-1980 and 1985-1987 shows a reduction in the frequency of several restrictive clauses, including export limitations (from 85 to 45 per cent of contracts), gratuitous grant-backs (from 55 to 18 per cent), and prohibitions on sub-licensing (from 98 to 73 per cent). In the Polish case, this may be due to the greater involvement of SME suppliers and acquirers, as well as the reduction in the scale of transactions, which occurred during the 1980s. Data from Latin America confirms that SMEs tend to impose less restrictions in contracts, particularly export and tie-in clauses. 39/ No data is available as to the situation relating to technology transfer within developed market-economy countries, although it might be supposed that the strengthening of intellectual property protection and the liberalization of competition policies would result in more restrictions in technology transfer agreements, at least in respect of new technologies. Presumably, similar policy trends in developing and Eastern European countries may have the same effect in future. But a full investigation of this phenomenon needs to be made before any conclusions can be drawn.

Part two

CHANGES IN GOVERNMENT POLICIES AND LEGISLATION RELATING TO TRANSFER AND DEVELOPMENT OF TECHNOLOGY

Chapter I

OVERALL CHANGES WITHIN DEVELOPED MARKET-ECONOMY COUNTRIES

42. As noted in the introduction, innovation and R and D promotion by Governments of market-economy countries has strongly increased in recent years. Other than direct R and D spending, a wide array of instruments has been used for this purpose. Collaboration between Governments and enterprises to stimulate R and D has been intensified through government financial support for R and D by universities - and other research institutions - and through government-industry co-operative national or international research projects. Competition law controls on R and D joint ventures have been liberalized in both the United States and the European Community (exploitation of results is also exempted in the latter); this would cover not just the establishment of ventures but also collateral restrictions such as patent pools. Protection of intellectual property and remedies against infringement have been strengthened, both at the domestic and border levels. In the United States, for example, new court machinery has been created (the Federal Court for Patent Appeals); the rights of patent-holders are now upheld in court judgements twice as often as in the 1970s; 40/ higher damages are being granted, as well as injunctions; while the Omnibus Trade and Competitiveness Act of 1988 grants much stronger rights and remedies to petitioners seeking to bar imports of alleged infringing foreign goods. The scope of protection of certain intellectual property rights has also been extended in developed market-economy countries. Since 1968, for example, 10 of these countries have extended full patentability to both pharmaceutical products and processes (although a few of these are still subject to transitional periods), and most of them have also strengthened protection for biotechnological innovations and have lengthened patent duration for all inventions (sometimes for chemical/pharmaceutical inventions in particular).

43. In order, inter alia, to stimulate R and D, technology importation and the competitiveness of their enterprises, Governments in developed market-economy countries, particularly the most advanced amongst them, have also liberalized authorization requirements for inwards foreign direct investment, as well as competition law controls on mergers, acquisitions, joint ventures and co-operation arrangements (although merger regulation has been adopted by more countries). Salient features include (a) a more liberal approach to vertical or conglomerate mergers in some countries, on the grounds that this will not increase market share; (b) a readiness to look not just at the degree of market power attained, but also at the "procompetitive efficiencies" that may follow from the merger; (c) a tendency, in evaluating the effects upon competition, to consider the relevant geographical market to be the world market, to widen the relevant product or technology market, and to consider potential as well as actual competitors; and (d) the favourable treatment of R and D joint ventures, already mentioned. 41/ In the United States, favourable treatment may also be provided to production joint ventures, while in the European Community a directive to clarify the competition rules applicable to joint ventures is under consideration. In developed market-economy countries, the liberalization of competition law

controls on restrictive practices, as well as of controls on technology importation (in Japan, Portugal and Spain), 42/ and the strengthening of legal protection for technology have also been done partly in order to stimulate technology importation. Other measures adopted for the same purposes, include lower tariffs for selected high-technology products and the tightening of legislation and measures relating to rules of origin, anti-dumping and local content. The effect of deregulation and privatization measures may also be a long-term increase in foreign investment in previously protected economic sectors, despite attempts made to favour investment by nationals in these sectors.

44. The strategies of developed market-economy countries relating to technology exportation have also evolved in recent years. There has been a liberalization of controls relating to outwards investment, foreign exchange and competition. On the other hand, Governments in developed market-economy countries continue for strategic reasons to restrict the exportation of some advanced technologies through controls co-ordinated by the Co-ordinating Committeee for Multilateral Export Controls (COCOM), although individual countries such as the United States have applied stricter national controls than are required by COCOM. The increase in "dual use" technologies (which can be used for both civilian and military purposes) has made the application of these controls more problematic. However, COCOM's rules will now be substantially relaxed 43/ and national controls have also been relaxed. 44/ Apart from such controls, some restrictions commonly placed in developed market-economy countries on technology generated from government-funded R and D may have the effect of preventing its international transfer. Examples of such restrictions are those which provide for sole or majority participation of domestic enterprises and institutions in R and D programmes, for licensing of R and D results only to domestic enterprises, or for exclusion of foreign enterprises 45/ unless they exploit the technology locally or otherwise contribute to the enhancement of the interests of the Government or of domestic enterprises. At the same time, there have been unilateral, bilateral and multilateral initiatives for stronger legal protection for technology, and for the relaxation of controls on foreign direct investment, technology transfer and imports of foreign high technology products and services. The "targeting" of individual countries in this connection, pursuant to the United States Omnibus Trade and Competitiveness Act 1988 and the consideration of these issues in the Uruguay Round negotiations illustrate the importance attached by Governments to these questions.

Chapter II

CHANGES IN THE COUNTRIES OF EASTERN EUROPE

45. There is a trend towards stronger intellectual property protection in most countries of Eastern Europe, which reflects perceptions of the necessity of adapting protection régimes both to the standards prevailing in the developed market-economy countries and to their internal economic evolution. It is likely that there will be further changes in the future. For example, the new "draft Law on Inventive Activity in the USSR" would abolish inventors' certificates and totally replace them with patents. Ownership of patents would no longer be automatically vested in the State, but would instead be granted to the inventors or innovators, be they physical or legal persons. The intention behind this proposed measure is to stimulate trade in technology. A new draft patent law is also being considered in Poland, as is the provision of sui generis protection for computer programmes (these are already protected by copyright in Hungary).

46. The countries of Eastern Europe have also very much liberalized their régimes governing foreign trade, investment and technology transfer over the last two decades in the hope of alleviating growing financial and economic problems. The previous system had been characterized inter alia by an orientation towards imports from other Eastern European countries, centralized administrative screening of all export and import contracts, the exclusion of equity forms of transfer, and a preference for co-operation-based transfer. The centralized system of project screening was gradually relaxed, and the approval system was substantially liberalized, for example for intra-Eastern European transactions by Hungary in 1986 and for all transactions by Poland in 1989. Equity forms of transfer have been promoted ever more vigorously and currently appear to be given the main emphasis in technology import policies. Continuous liberalization of joint venture laws and policies has taken place, inter alia in respect of such elements as majority foreign holdings, permitted economic sectors, transfer of profits abroad, and favourable taxation and foreign exchange régimes. The speed of change has grown ever faster. Very recently, for example, the Czechoslovak Government indicated that it will amend its law on joint ventures and will completely overhaul its legislation dealing with inward investment, 46/ although a new joint venture law came into force in 1989. One of the most recent developments has been the emergence and spread of free (or special) economic zones. It may be noted that the joint venture legislation of the countries of Eastern Europe rarely deals in any depth with technology transfer, although the acquisition of technology, particularly advanced technologies, is stated to be one of the major reasons for the adoption of such legislation. In this respect, it is similar to the joint venture legislation of developing countries such as Cuba, Ethiopia, the Democratic People's Republic of Korea or Viet Nam; on the other hand, in China there is more detailed regulation of the technology transfer aspects of joint ventures. Relatively less policy attention is now being given in the countries of Eastern Europe to some of the more traditional channels of technology importation through managed trade, imports of capital goods, East-West industrial collaboration agreements, countertrade or licensing. However, capital goods importation probably still continues to be the most important channel of technology transfer.

47. The technology export efforts of the countries of Eastern Europe have intensified in recent years, with particular attention being paid to expansion of equity-based foreign direct investment and licence trade. For example, a joint venture "Tecnopark" is being planned between the USSR Government and some Italian firms to develop prototypes based on USSR technology for commercial exploitation in developed market-economy countries. 47/ Attention is also being paid to diversification in developing country export markets. 48/ Incentives for enterprises to export have been strengthened by allowing them to retain profits, as well as by export quota retention schemes.

Chapter III

OVERALL CHANGES IN DEVELOPING COUNTRIES

48. In the late 1960s and early 1970s, a number of countries such as India, Yugoslavia and several Latin American countries introduced changes in their industrial property systems aimed inter alia at encouraging the local working of inventions and preventing the use of intellectual property régimes to preserve import monopolies or to impose restrictions in licensing agreements. However, the application of these new régimes was sometimes difficult, since they were regarded as restrictive by trading partners and foreign corporations. While some countries were making such changes, other developing countries, mainly those with a weaker technological base, continued to maintain their traditional intellectual property régimes or to adopt intellectual property legislation where they did not already have it.

49. More recently, as a result of increased criticism by foreign firms and mounting pressures from trading partners, a number of developing countries have modified their intellectual property legislation to strengthen protection or introduce new enforcement measures. For example, the Mexican Government has indicated that it will soon be adopting legislation to strengthen intellectual property protection (already strengthened in 1986) by inter alia extending the duration of patent protection from 14 to 20 years. 49/ Mexico is also considering the reinforcement of penalties for unauthorized disclosure of secret know-how.

50. Chile is understood to be considering the adoption of a new law on industrial property which grants protection to pharmaceutical patents for 15 years, retroactive to 1985. 50/ Similar changes have been adopted by the Republic of Korea, Indonesia and Singapore, all aimed at extending the scope of protection of IPRs.

51. The strategies of the Governments of developing countries more directly relating to the acquisition of technology have also undergone many changes. In the late 1960s and the 1970s, a number of Governments enacted laws and regulations on transfer of technology or incorporated technology import guidelines into their broader foreign investment policies. Government agencies were also established to screen technology transfer transactions and to assist local enterprises in the negotiations of contracts. The pioneering countries in this respect included the Andean Pact countries, Argentina, Brazil, India, Mexico and the Philippines. At the multilateral level, developing countries promoted initiatives for the adoption of an international code of conduct on the transfer of technology.

52. The objectives sought through these technology transfer régimes included (a) the improvement of the commercial conditions of agreements, particularly the prices charged (taking into account foreign exchange and tax evasion problems); (b) the elimination or reduction of restrictive practices; and (c) the unpackaging of the different components transferred. Other objectives included the avoidance of the importation of technology which was already locally available, the improvement of conditions for the assimilation and adaptation of the transferred technology, the control of the intra-firm operations of TNCs, and the reduction of the durations of contracts. While the screening process and the control of contractual mechanisms have had a definite impact on licensing agreements, especially with regard to royalty

payments, restrictive practices and duration of contracts, 51/ it is not clear to what extent other objectives may have been attained, especially in view of the fact that transactions such as contracts for the acquisition and/or installation of machinery and equipment or public procurement were usually outside the competence of technology transfer agencies. Moreover, the focus on "control" might sometimes have led to less attention being given to other crucial aspects such as the process of technology assimilation by local firms, the upgrading of technological capabilities in the country, and the monitoring of the implementation of contracts.

53. Steps have now been taken in most developing countries with technology transfer régimes to address some of these above-mentioned deficiencies. Technology transfer régimes have been refined to reflect development priorities with respect to specific industrial sectors or technologies and to provide for guarantees and other conditions that agreements should include, such as liability clauses, performance guaranteees 52/ and protection against infringement (the contents of chapter 5 of the draft code were particularly influential in this respect). Special programmes with respect to new technologies have also been adopted in some countries. Technology-importing firms in some countries are given advice on training and R and D programmes, while suppliers are required to contribute to R and D either in the recipient enterprise or in the country generally. 53/ Stronger efforts are being made to provide better data and advisory services to local enterprises in respect of selection of technologies and foreign suppliers and negotiation of contracts. 54/ These requirements suggest the emergence of a new approach which emphasizes more effective collaboration between partners to attain real technology transfer, rather than mere control of contractual aspects of transactions.

54. A number of countries have also liberalized the provisions of their technology transfer legislation in varying degrees or relaxed the implementation in practice. This has been because of: (i) concerns (heightened by the increased need for foreign capital) about the possibility of "disincentive" effects on foreign investment and on technology transfer and absorption, particularly of new technology; (ii) the belief in some countries that the increased negotiating capabilities of national enterprises may have lessened the need for government intervention; (iii) the accumulation of more experience by the competent authorities, leading to greater selectivity and flexibility in the application of controls; and (iv) possible bilateral pressures. Liberalization has taken place on such questions as the need for authorization of some contracts, 55/ the limits on prices for technology, the acceptability of royalty payments between parents and subsidiaries, longer durations of contracts, restrictive practices, and international arbitration. Flexibility is being shown, in particular, where the technology being transferred is advanced, export-promoting or import-substituting, labour-intensive, or is to be applied in industries considered of great economic importance. In some countries, such as Argentina, 56/ liberalization has been quite marked, sometimes resulting in a change from registration subject to approval to automatic registration for recording purposes only.

55. However, in such cases, the competent authorities do tend to retain a lot of direct or indirect influence, particularly in relation to payments and some restrictive practices, although intervention is applied with much greater flexibility and discretion. In the Republic of Korea, for example, although a reporting system has been substituted for an approval system in respect of

technology inducement contracts (even reporting is not necessary for minor contracts), the Office of Fair Trade can intervene if the agreement contains unfair conditions. Moreover, there are wide differences in the degree and pace of liberalization among different countries. Yet overall, the liberalization has resulted in increased understanding, co-operation and dialogue between the authorities and suppliers.

56. The liberalization of technology transfer régimes has taken place in parallel with, but not to the same extent as, liberalization in foreign investment régimes in respect of such aspects as the reservation of certain fields or sectors of economic activity to the State or to national enterprises (trends relating to privatization and debt equity swaps have also had an effect here); limitations on the acquisition, or requirements for reductions in share ownership, of domestic enterprises; and controls on remittances of profits and capital. A large number of developing countries (particularly in Africa and Asia) have adhered to the Convention establishing a Multilateral Investment Guaranty Agency (MIGA). Governments are also now actively prospecting for potential foreign investors and technology suppliers, including SMEs, and helping them to find local partners.

Chapter IV

TREATMENT OF RESTRICTIVE PRACTICES IN DEVELOPED MARKET-ECONOMY COUNTRIES

A. Changes in conceptual approaches

57. The extensive liberalization of competition laws and policy in most developed market-economy countries has significantly affected the treatment of restrictive practices. Over the last two decades, one main trend that can be discerned is the greater weighting provided to doctrines which tend to exempt restrictive practices from the application of competition controls and the reduced weighting given to doctrines which might lead to such application. In the former category may be included the doctrines of the per se legality of practices based upon the rights granted by intellectual property titles and the rule of reason or legitimate interest, while in the latter category would come the doctrines of per se prohibitions, abuse control of market-dominating positions, and the market power conferred by intellectual property rights. Public interest considerations which would tend to exempt practices are also given a greater weight. Particularly favourable treatment is being provided to restrictions imposed in the context of "vertical" relationships, although the distinction between "vertical" and "horizontal" transactions is not without its difficulties. The application of competition law to parent-subsidiary relationships continues to be generally excluded, although in the European Community the theory of the economic unit is not necessarily accepted automatically, and the relationship of interdependence between parents and subsidiaries may have to be proven in individual cases.

58. According to the doctrine of per se legality now applied in some developed market-economy countries, the grant of an intellectual property right implies the right to impose restrictive clauses upon licensees which are within the scope of the protected rights. 57/ Some laws extend this doctrine to other practices which are not a direct outflow of intellectual property rights, but closely related to them. 58/ In some countries, "white" lists containing practices which will not be attacked under competition law have been established through legislation or by enforcement authorities. Among the practices considered to fall within the ambit of such "white" lists are the following: refusal to grant licences; prohibition of sub-licensing; field-of-use restrictions pertaining to type (i.e. only manufacturing or distribution), technical field, or product markets; restrictions relating to volume, territories, or possible customers; time restrictions (within the life-time of the protected right); restrictions on the use of still valid intellectual property rights after termination of the agreement; and non-disclosure obligations (in case of know-how). The per se legality approach has been advocated in particular by the United State's Department of Justice, which has stated that the "owner of intellectual property is fully entitled to enjoy whatever market power the property itself may confer". 59/

59. However, while most developed market-economy countries have tended to broaden the scope of permissible practices in the context of intellectual property rights, the exercise of such rights is never entirely out of the reach of competition law. The European Court of Justice, for example, makes a distinction between the existence of a right and its exercise, which can constitute an abuse of a dominant position where there is, for example, an arbitrary refusal to supply spare parts, unfair pricing, or the non-production of spare parts in current use. 60/ The prevention of parallel imports within

the European Community by holders of intellectual property rights is also not allowed. 61/ Moreover, the doctrine of per se prohibitions under competition law is still applied in many countries to: (a) practices which are not covered by the rights conferred by the intellectual property legislation at all, such as the transfer of a minor or even entirely worthless intellectual property right only as a pretence to introduce restrictive clauses or clauses which extend restrictive practices allowed in case of intellectual property rights to products, services or markets not covered by the intellectual property rights involved (such as price fixing, market sharing and similar practices for unprotected products); 62/ agreements between competitors or potential competitors such as cross-licensing or patent pooling (although the application of competition law in some countries would depend upon whether the agreement restrains competition between the parties or hinders possible competition from third parties); and (c) in a few countries, some vertical restrictions such as vertical price fixing. Thus, corresponding to the "white lists" mentioned above, there are also "black lists" containing practices which are prohibited per se. Some of the practices which had previously been considered as per se violations of competition law and to which more lenient approaches are now being advocated include tie-ins; exclusive dealing (tie-out); and price-fixing.

60. The shift away from per se condemnation of restrictive practices has also led to a greater reliance on the doctrine of the rule of reason or legitimate interest and the evaluation of practices in a more flexible manner on a case-by-case basis. Particularly in the United States, this shift has been based upon the concept that certain restraints may be "essential to ensure that the new technology realizes its maximum legitimate return and benefits consumers as quickly and efficiently as possible". 63/ There is also leniency towards restrictions which are not considered to have substantial effects on competition and not to restrict the recipient unfairly. Under this approach of the United States Department of Justice, practically all non-price vertical restraints should be subject to the rule of reason. In particular, the famous "Nine No-No's", previously considered as per se violations, would also be considered under the rule of reason. The EEC block exemptions also show more flexibility than some of the previous decisions of the EC Commission and the Court of Justice.

61. The application of the case-by-case approach has, in most jurisdictions, depended decisively upon the tests used to allow or prohibit the practices in question. One such test has been the ancillary restraints test, under which those restraints which are reasonably connected with a technology transfer and are necessary to achieve the legitimate aims of the transactions are acceptable. Such practices can include limits on the quantity of output in the case of second source supplies; certain forms of unilateral grant-backs; or certain forms of export and exclusivity restrictions. Another test has been the one relating to the effects of the practice upon competition. In this respect, there are wide differences among jurisdictions. In some countries, any act which restricts the freedom of action of the parties involved or which tends to raise market entry barriers or freezes market structures continues to be considered a restraint. In other countries, all practices which permit the innovator to capture the surplus inherent in his innovation are considered to be pro-competitive, even if they impose

restrictions upon the licensee or third parties. With respect to the nature of the restraint, in some countries, it is only necessary for a restraint to be perceptible, others require a substantial restraint, while still others require that the restraint must result in market power or even a market-dominating position.

62. The most lenient approach with respect to restrictions in technology transfer arrangements is taken by the United States Department of Justice, particularly when one compares the content of the 1977 International Guidelines 64/ with the 1988 version. This policy approach is also strongly reflected in a recent OECD report (see footnote 62). Since there is considerable divergence between the 1974 OECD Council Recommendations 65/ on this subject and the new report, the OECD Council withdrew the 1974 Recommendation on 31 March 1989 and recommended that Governments take into account the new report to the extent possible.

63. In respect of the doctrine of abuse control of a market-dominating position, developments that may be observed in a number of developed market-economy countries include a tendency to extend the scope of the relevant geographic and technology or product market; lesser concerns about monopolies (resulting therefore in more acceptance of abusive practices, provided that they increase efficiency); and a critique of the theory of leveraging or extending market power to other markets. Although these approaches have been supported in the above-mentioned OECD Council recommendation, it is not clear whether all OECD members fully subscribe to such approaches at the national policy level. A number of countries, for example, still consider tie-ins by market-dominating enterprises to be illegal, even if the price charged does not exceed the consumer surplus. However, it is now accepted in many jurisdictions that intellectual property rights do not automatically confer market power. Under this approach, in order to establish such market domination, a careful analysis of the economic parameters characterizing the competitive situation in the individual case has to be undertaken.

64. Public interest considerations have played an increasingly influential role in recent years in the application of competition law. Some laws consider the promotion of international competitiveness as a pro-competitive element per se, 66/ while other laws are more cautious and only accept it as an argument for not prohibiting a certain restrictive practice. National security or public interest may also be used as a criterion for permitting and legalizing a restrictive practice which would be otherwise prohibited. However, public policy issues are more frequently taken into account in controlling mergers rather than restrictive practices. In addition, under general principles of international law, anti-trust legislation would also not be applied to restrictive practices which are the result of restraints imposed by a foreign Government acting within its legitimate sphere of authority. Even when the restrictions are not imposed in the form of strict legal compulsion, considerations of comity may lead to non-prosecution. With the growing involvement of Governments in the promotion and regulation of export activities, this aspect has gained additional importance in recent years.

B. Grant-back provisions

65. In the specific area of grant-back provisions, a more critical attitude towards grant-backs may be noted in the European Community. Non-exclusive reciprocal grant-backs are still not considered to be a restriction on competition, but three forms of grant-back have been added to the "black list" in the patent and know-how block exemption regulations, i.e. grant-back licences which are of a longer duration than the licensee's right to use the licensor's technology, obligations upon the licensee to assign rights to improvements to the licensor, and exclusive grant-back. However, the Know-how Block Exemption provides that the licensee's rights to use his invention and to license to third parties are subject to the conditions that his improvements are separable from the licensor's know-how and that licensing to third parties does not disclose secret know-how communicated by the licensor. On the other hand, the United States Department of Justice Guidelines appear to leave open the possibility that unilateral or exclusive grant-backs may be considered pro-competitive. In Japan, unilateral grant-backs are also treated in a more lenient way - if they are non-exclusive, they are no longer condemned per se, but are only considered as a "grey list" item, to be evaluated under the rule of reason.

C. Export restrictions

66. The treatment of export restrictions in licensing contracts has been liberalized in a number of developed market-economy countries. There is a clear tendency to consider the full exercise of the rights conferred by industrial property rights as more important than the avoidance of territorial restrictions. Even market allocation as part of a cross-licensing agreement is no longer prohibited in a per se manner in some countries. 67/ There is also a tendency to accept territorial allocation on the manufacturing level more easily than on the distribution level. Thus, within the EEC, the prohibition of parallel imports is still not accepted once the goods protected under intellectual property rights have been put on to the market. This approach has been strongly influenced by the EEC-specific aim of integrating the national markets of the EC member countries, although the block exemptions on patent and know-how licensing provide for a more lenient treatment of restrictions on "active sales" (involving publicity). Export restrictions in vertical arrangements are seen as less critical. In particular, a restriction of intra-brand competition is often not sufficient to justify government intervention. In general, there is a growing tendency to disregard differences between intellectual property rights and secret know-how in the formulation of the scope of acceptable export restrictions. Meanwhile, the "effects" doctrine, under which export restrictions imposed by a domestic technology supplier must have an effect on domestic markets before they can be challenged, has been restated and partially strengthened in some developed market-economy countries, although the Federal Republic of Germany has extended the application of its competition law to the participation of its enterprises in international market cartels, even if they do not affect the domestic market.

D. Restrictions after expiration of the arrangement

67. The treatment of restrictions after the expiration of arrangements has also been liberalized. Post-term use bans are now accepted in developed market-economy countries, not just in respect of intellectual property rights, but in respect of secret know-how as well. However, the new approach of the EEC Commission to grant-back provisions noted above, where the know-how of the recipient and of the supplier are not separable, may also be utilized in case of post-term-use bans. In certain cases, the supplier may be obliged to permit continued use of his technology, if the recipient has added substantial improvements which are not separable, or if the recipient agrees to reciprocity and if the supplier has no justifiable grounds to object to the continued use of the technology by the recipient.

Chapter V

TREATMENT OF RESTRICTIVE PRACTICES IN DEVELOPING COUNTRIES

A. General approaches

68. In developing countries with technology transfer régimes, as indicated above the treatment of restrictive practices has also been liberalized to varying degrees. However, this liberalization has not been a result of a change in legal doctrines, as in developed market-economy countries. The treatment of restrictive practices in developing countries was, and continues to be, based upon broad concerns relating to potential adverse effects upon the economy or development (including technological development) of the acquiring country, although such concerns might also include the possible anti-competitive effects of restrictive practices. In line with this approach, the existence of parent-subsidiary relations between suppliers and acquirers did not usually exempt them from the application of technology legislation; indeed, stricter rules have sometimes been provided for such transactions. Now, however, there has been extensive liberalization of this in practice. It was because of this difference of approach that developing countries which already had legislation on competition (such as a number of Latin American countries) enacted special legislation dealing with transfer of technology. On the other hand, the Republic of Korea controls "unfair" practices in technology transfer transactions through the application of its competition legislation, using an approach which is, in practice, similar to that followed in its earlier technology transfer legislation 68/ (Japan had also followed this pattern).

69. On the whole, the technology transfer régimes of developing countries have tended to avoid use of the rule of reason, at least as an explicit legal concept. They have usually preferred outright prohibitions of specified practices (although the list of practices was often illustrative), which were often combined with special exceptions under which such practices might be acceptable and a general exception provision allowing the authorities to accept practices when it was in the national interest or when benefits would accrue to the national economy. Such possible benefits may be specified in general exception clauses in a quite detailed manner - the new Mexican regulations (see footnote 54), for example, refer to job-creation, upgrading of technical skills, manufacture of new products (especially if they are import-substituting), foreign exchange benefits, reduction in the unit costs of production, promotion of local suppliers, use of technology not harmful to the environment, and promotion of R & D activities. The liberalization in many technology transfer régimes has not substantially changed this legal approach - what has changed is mainly the reduced breadth of the prohibitions, the widening of exceptions and (more frequently) the willingness of the authorities to resort to the general exception clause. There is thus an increasingly large gap between the formal rules established by technology legislation and their application in practice. This should be taken into account in the review which follows of the treatment of certain practices.

B. Treatment of grant-back

70. There has been little legislative change in the treatment of grant-back, and there continues to be a wide variation in the treatment of grant-back clauses by technology transfer laws. The Andean Pact countries (except for Venezuela) have an absolute prohibition of grant-back. Others forbid them if they are exclusive (Brazil), or gratuitous or onerous (Nigeria, Mexico). The new Mexican regulations follow the previous regulations in also allowing grant-backs when there is reciprocity or a benefit for the acquirer in the exchange of information, or when there is a preferential agreement with the supplier to negotiate on the improvements under the same terms as offered to third parties. Still other developing countries (India, Malaysia, Zambia) do not even mention grant-back in their guidelines or legislation. China forbids grant-back when it is "inequitable".

C. Treatment of export restrictions

71. There has also been little change in the legislative treatment of export restrictions. Thus, the new Mexican regulations remain largely unchanged from the previous regulations in prohibiting export restrictions only where there is a total ban on exports, where the acquirer has been obliged to export only through the supplier, where prior authorization is required from the supplier, or where there are volume limits. Special exceptions are allowed for franchise agreements, reservation of markets by the supplier himself, or the grant of exclusive rights to third parties. The Nigerian law 69/ also forbids export restrictions only when they are total, unless they are also unreasonable, or unless the acquirer is obliged to export only through the supplier or a designated third party. The Malaysian guidelines 70/ forbid all restrictions in principle, but allow special exceptions where the supplier is manufacturing himself or has given exclusive rights to others, or where he is not legally empowered to allow sales based on his technology. The most flexible approach is that of the Indian guidelines, 71/ which only state that there should be no export restrictions to the "fullest extent possible". On the other hand, in Brazil, restrictions are forbidden, except where permitted by industrial property laws, required by the supplier's home country legislation, or in pursuance of an international agreement to which Brazil is a party, while in Zambia 72/ and in Peru 73/ (the latter in accordance with Decision 24 of the Andean Pact), there is an absolute prohibition on export restrictions, except in exceptional cases which might be allowed by the competent authority. In Peru, however, in no case can export restrictions be accepted in connection with subregional trade or in connection with the export of similar products to third countries. Finally, it is interesting to note that in China, export restrictions are forbidden, except when they are agreed upon by both parties to a joint venture.

D. Treatment of restrictions after expiration of the arrangement

72. The question of restrictions after expiration of the arrangements (or post-term bans on use of secret know-how) has been problematic for the legal régimes in some developing countries because secret know-how is considered to be information rather than a species of intellectual property, so that it should remain with the recipient at the end of the arrangement, and he should

also be free to transfer it to third parties. This legal concept of secret know-how has not changed, and the legal prohibition of post-term use bans stays intact in many national technology transfer laws. In Brazil, even use bans for the duration of the arrangement are not necessarily accepted, and confidentiality restrictions are permitted only for a reasonable period after the know-how transmission. On the other hand, some technology transfer legislation (e.g. in the Andean Pact countries or India) does not deal explicitly with such bans, while Mexico now allows such bans not only where the know-how is not used in the acquirer's operations, but also where a supplementary agreement for the transfer of new improvements has been signed (in which case the duration of confidentiality cannot exceed 10 years) and when there is a risk that dissemination of the know-how would mean its loss to third parties.

Chapter VI

TRENDS RELATING TO CHOICE OF LAW

A. Trends in developed market-economy countries

73. Given the numerous channels and forms of technology transfer, developed market-economy countries do not have special choice-of-law rules for technology transfer contracts but apply the rules applicable to all commercial transactions. Over the last two decades, there has been a widening of parties' freedom to choose the law applicable to their contracts. Conversely, there has been a weakening of any requirement that the law chosen should be that of a country with a substantial connection with the contract, be it the country of performance or the recipient's or the supplier's main place of business. 74/ However, there continues to be a recognition that the parties' choice of law is subject to the application of the forum's public policy or ordre public. The applicability of other countries' public policy/or of their legislation providing for world-wide application (i.e. "lois d'application directe" or "lois de police") has also sometimes been recognized. 75/ However, the application of these would be at the discretion of the courts. Where no choice of law has been made by the parties, there has been a trend towards applying the law of the supplier's place of business, 76/ but it is not universal. 77/ Legal writers are also divided over whether the law applied in such a case should be that of the supplier's or the recipient's country but tend to see party autonomy as restricted more by local intellectual property laws (which are territorial in nature) than by public policies of the acquiring country.

B. Trends in countries of Eastern Europe

74. In these countries, it continues to be the practice to allow a substantial degree of freedom to contracting parties in foreign trade, licensing or joint venture transactions to define their rights and obligations as they wish, including by a choice-of-law clause referring to a mutually accessible and acceptable foreign legal system (most often the Swedish legal system). Where there is no choice of law, there are divergences in the solutions applied by different legal systems. In the USSR, the applicable law would be the place where the agreement was concluded, while the Hungarian Decree-Law of 31 May 1970 would apply the law of the supplier's country. The choice of law by the parties, or the application of any foreign law, would, however, be subject to the application of mandatory provisions of domestic law. In the USSR, for example, joint ventures have to observe all mandatory provisions of the Council of Ministers' enabling decree, and the parties cannot validly agree among themselves not to observe relevant provisions of labour law, tax law, accounting procedures and the like.

C. Trends in developing countries

75. Most technology transfer laws in developing countries continue to specify that national law should apply to technology transfer contracts, although there is a widespread acceptance of international arbitration. Indeed, in Mexico, the mandatory nature of the technology law, and its public policy character, has been spelled out so as to stress that any choice of foreign law will be null and void. These attitudes stem from the feeling that, as the

acquiring country is most directly affected (because the technology is used and paid for in it), the choice of a foreign law by the parties should not be used to defeat the application of its policies. These attitudes have not fundamentally changed, even in Latin American countries where the Calvo doctrine has been weakened in other respects through the acceptance of international arbitration. For example, the Mexican law specifically states that, in an arbitration, the arbitrator should apply Mexican law "substantively" to the controversy, leaving open the possibility that, on questions of form or procedure, other laws may be applied. However, in this as in other respects, the attitudes of developing countries have become much more flexible in recent years.

Part three

IMPLICATIONS OF FINDINGS AND RELEVANCE TO CODE NEGOTIATIONS

Chapter I

POSSIBLE IMPLICATIONS OF FINDINGS FOR INTERNATIONAL TECHNOLOGY TRANSFERS

A. Overview

76. The discussion in the two preceding parts of this study has shed light on the important changes that have occurred in the area of technology since the start of the negotiations on an international code of conduct on the transfer of technology in the late 1970s. These changes are undoubtedly of signal relevance to the code negotiations, as well as to the end result of negotiations. Their significance to the code arises, in particular, from their impact on international technology transfers. It is therefore important to assess the specific implications of these changes for international technology transfer, particularly to developing countries, before examining their possible effects on the code negotiations.

77. The 1980s have seen a considerable proliferation in international joint ventures, licensing and other technology transfer arrangements. However, while the rate of increase of technology-related flows has been strong in most developed market-economy countries and a relatively small number of developing countries, there has been a slow-down in such flows to most developing countries. The question as to whether significant amounts of new technologies or technological capacity have been transferred to developing countries compared with what has occurred in developed market-economy countries is one that is beyond the scope of this study. This report has indicated the positive aspects of inter-firm co-operation, as well as less welcome aspects, namely the high degree of concentration and the lessening of competition between firms. There is reason to worry that such industrial concentration, in so far as it primarily occurs in developed market-economy countries, might both reduce the competition between the alternative suppliers of technology on the world market and make it more difficult for developing countries' enterprises to break into world markets.

78. The revision of intellectual property régimes in the OECD countries, as well as in many developing countries, has unquestionably resulted in strengthened protection in favour of patent, copyright, and trademark holders who are pursuing infringers and collecting fees from distant companies they would not have pursued a few years ago. Stronger protection, especially when combined with the liberalization of competition rules, may be expected to lead to higher royalty payments and a higher rate of imposition of restrictive practices in licensing agreements.

79. On the other hand, the objectives underlying the liberalization of competition rules is to promote innovation and permit an increased generation of technologies through closer co-operation among enterprises. Although the effects of such policies will be initially felt only in developed market-economy countries, it is to be hoped that developing country enterprises too will be able to benefit from the technologies so generated in the medium or long term.

80. Liberalization and technology promotion policies have also been pursued in recent years by developing countries. The relaxation of foreign investment and technology transfer régimes and the growing emphasis on promotion rather than control of technology transactions with foreign enterprises have been reviewed in the study. It is too early to assess the results of this policy approach, but it might have a favourable impact on international technology transfer to developing countries.

81. These issues are discussed in more detail in the following sections.

B. Possible effects of concentration and collaboration

82. There is ample evidence to confirm a growing degree of concentration and collaboration among enterprises in developed market-economy countries, particularly in high-technology sectors, for reasons which are often related directly or indirectly to technological change. Even though more concentration and collaboration may not lead to a diminution of technology sources in the home country or countries of the enterprises concerned, this may not be the case in other countries which are obliged to import the relevant technology and for which technology sources may already be limited. Within a coalition of allied companies, there may even be more technology transfers than before in order to achieve the systematic advantages or the network externalities of alliances. However, the wave of mergers, acquisitions, joint ventures and technological collaboration arrangements that has occurred among enterprises in developed market-economy countries does not so far extend to any substantial extent to developing country enterprises. The net effect for the latter enterprises may therefore be a reduction, at least in the short term, of sources of supply of technology, particularly of new technologies.

83. Moreover, it is possible that, as a result of this trend, some industries will come to be dominated by competing transnational coalitions. It has been suggested that "in the 1990s, competition will no longer be between individual companies but between new, complex corporate groupings. A company's competitive position no longer depends only on its internal capabilities; it also depends on the type of relationships it has been able to establish with other firms and the scope of these relationships". 78/ As well as making it more difficult for developing country enterprises to compete (thus reducing their ability to pay for technology), this might further reinforce the bargaining power of technology suppliers. This would make it more difficult for technology acquirers, particularly in less technologically advanced countries, to obtain fair and equitable terms in technology transfer transactions. Of course any reduction in technology sources from concentration and strategic collaboration should be set against other trends such as the incentive provided by faster innovation to sell technology, the increase in the involvement of small and medium-sized enterprises in international technology transfers and the growing ability of developing country enterprises to engage in such transfers.

C. Stronger protection of intellectual property rights and technology transfer

84. Enterprises are making greater efforts to protect their technological assets through resort to greater secrecy, pressure on Governments to adopt higher levels of protection and stronger enforcement measures, and greater

emphasis in contracts on restrictions related to confidentiality. These strategies of developed market-economy enterprises have often received the support of their Governments both through national policy or legislative changes relating to intellectual property protection and competition, and related international initiatives. The Governments of some developing countries have also enacted legislation providing stronger protection for intellectual property rights. In future the extent to which technology protection régimes will be strengthened world-wide will depend in large measure upon ongoing multilateral negotiations in this area.

85. As has been shown in this study, strengthening of protection régimes would have very important implications for technology transfer. It is possible that stronger protection may be used by foreign intellectual property holders in many countries, especially developing ones, to maintain import monopolies rather than to work the technology locally or to license it to other enterprises. This is borne out by the fact that a minimal fraction of inventions protected in developing countries are actually exploited in those countries. Even where suppliers are interested in transferring their protected technology, stronger protection would further boost their bargaining position and allow them to charge higher prices and impose restrictions in licensing agreements. There is already limited evidence that royalty rates and technical services payments have increased over the last decade, particularly for new technologies. Given the foreign exchange constraints faced by most developing countries, higher prices for technology or for products made therefrom could only be paid for by reductions in the volume of imports, including imports of technology. Of course, the payment problem would not be so acute, at least in the short term, in cases where technology transfer is effected through an equity-related channel, but suppliers have shown themselves to be wary of equity involvement in precisely those countries which would have the worst problems in paying for technology.

86. On the other hand, given the importance attached by suppliers to the protection régimes of potential recipient countries, stronger protection could lead to greater willingness to transfer technology, particularly new technologies. There is growing evidence that the existence of a "protection gap" among countries might lead to delays in technology transfer, with potential technology suppliers insisting upon adequate protection in the recipient country before proceeding with the relevant investment or technology transfer. For technology suppliers, "inadequate" or "ineffective" protection is increasingly considered as an unwillingness to play by the rules of the game. However, although stronger protection may be a necessary condition for greater transfer, particularly of more advanced technologies, it is far from being a sufficient condition, given the importance of other factors, such as domestic market size, economic performance and prospects of the recipient country, availability and cost of skilled labour and ease of communications with the country concerned.

D. Liberalization of controls on restrictive practices

87. The effects of stronger protection for technology need to be assessed in conjunction with the universal trend towards liberalization of controls on restrictive practices in technology transfer transactions. In developed market-economy countries, greater weight is being attached to the doctrines of the per se legality of practices based upon the rights granted under

intellectual property laws, and of the rule of reason, as well as public interest considerations tending to exempt practices from the application of anti-monopoly regulations. A necessary corollary of this strengthening of some competition policy doctrines has been the weakening of the doctrines of per se prohibitions, abuse control of market-dominating positions, and the market power conferred by intellectual property rights. There has also been a trend to assimilate the protection of secret know-how with that of intellectual property rights. Liberalization has also occurred in developing countries, although it has occurred on a pragmatic basis rather than as a result of any change in legal doctrines. There has been a relative shift from concerns relating to the adverse effect of restrictive practices on the quality of technological acquisition and diffusion to concerns about the perceived "disincentive" effects of controls upon the quantity of technology acquired. There has also been a realization that control of practices in order to obtain a "good" contract did not necessarily ensure successful technology transfer and assimilation. Liberalization in developing countries has manifested itself particularly in the willingness of the competent national authorities to make exceptions to the application of their technology transfer legislation on grounds of national interest or benefits for the economy.

88. The available evidence confirms that technology suppliers consider restrictive practices, particularly export or market limitations and exclusivity provisions, to be important in preventing competition from the acquirer or third parties and in maintaining maximum possible control over their technology. To the extent that stronger protection for technology, and the liberalization of controls on restrictive practices, might also legally allow them to impose such restrictions, it is possible that this will result in the prevalence of more restrictive practices in technology transfer transactions. However, the fact that some developing country acquiring enterprises have learnt to bargain better or have more technological capacity, might help to partially offset this trend. Indeed, in some Latin American countries, a reduction in restrictive practices has been reported, which is mainly ascribed to the ability of local enterprises to negotiate better terms and conditions.

E. Policies for promotion of technology transfer in developing countries

89. The economic and financial problems in many of the less technologically advanced countries, the relative decline in technology flows to these countries and the importance attached to new technologies have also led to much greater efforts to attract technology transfer and foreign investment, which contrast with the greater regulation and control of such activities in the past. The range of new policy approaches adopted includes more active search for and assistance to potential foreign investors and suppliers; more investment incentives; greater selectivity and focus with respect to technologies acquired, with particular emphasis on new technologies; and more advisory services to local enterprises in respect of selection of technologies and suppliers and negotiation of contracts. There have also been attempts to maximize the quality of technology transfer and absorption through more emphasis on guarantees and liability clauses and more performance requirements relating to training and R and D.

90. Thus, the overall policy trend seems to indicate less emphasis on control over foreign direct investment or on the contractual aspects of technology transfer. There is also growing government support for importing technology in specifically targeted sectors. This promotional approach is aimed at encouraging foreign investment and transfer of technology and removing those policy elements that were perceived as disincentives by foreign partners. There has been a similar extensive liberalization of policies towards foreign investment in the countries of Eastern Europe.

91. Technology transfer promotion policies in developing countries appear also to be geared towards deriving maximum benefits from the growing technological co-operation among Governments and enterprises in developed countries. As indicated above, a trend towards more co-operation in technology generation and transfer, motivated by considerations of the increasing cost and complexity of technology, can be observed in all countries and at all levels. At the governmental level, a large number of bilateral agreements on science and technology, investment and double taxation have been concluded. Co-operation among enterprises, especially in DMECs, has also intensified. In technology transfer arrangements in some developing countries, there is now closer involvement between suppliers and recipients, leading to more linkage of technical services with different channels and forms of transfer and lesser reliance on arms-length contractual forms such as vertical licensing or turn-key contracts. Moreover, there is more use of joint ventures and collaborative arrangements as channels for technology transfer. All these developments could favour an increased international technology transfer to developing countries, if properly channelled towards the attainment of this purpose through national and international policy actions.

Chapter II

RELEVANCE TO THE NEGOTIATIONS ON AN INTERNATIONAL CODE OF CONDUCT ON THE TRANSFER OF TECHNOLOGY

92. The evidence presented in this study indicates that important developments affecting international technology transfer have taken place since the inception of the negotiations on the draft code of conduct. These changes have given rise to conceptual and policy shifts which are of signal relevance to the negotiations on the draft code of conduct. In view of the protracted negotiations on the code of conduct, it was to be expected that their final outcome would somehow be affected by the ever-changing technological landscape and its related policies and strategies.

93. As shown in the preceding chapter, these changes have profoundly affected, and will undoubtedly continue to affect, international technology transfers, particularly to developing countries. They have also made concerted international action in the field of technology transfer more important than ever before, as the need to co-operate closely on technology matters not only among enterprises but also among Governments has increased due to the growth in the cost of technology development and the increased complexity of its transfer. Meanwhile, the need for technology transfer to developing countries has also intensified as a result of the widening of the R and D gap between them and the developed countries and the increasingly decisive importance of technology in economic development and international trade. Moreover, the recent international initiatives for strengthening the world-wide protection of intellectual property rights in order to improve the capacity of technology owners to appropriate more effectively the fruits of their investment entail a corresponding international action on the "dynamic" aspects of such appropriation through the establishment of a framework of principles and rules on the international transfer of technology. The failure to adopt an international framework for inter-enterprise and intergovernmental co-operation on the transfer of technology might result in an unbalanced situation which would be tc the particular disadvantage of less technologically advanced countries. Such countries would be required to improve the terms of protection of foreign technologies without a concomitant improvement in the terms of transfer of such technologies.

94. Such rules and principles would greatly enhance the stability and predictability needed for the free flow of technology among nations, thus benefiting not only technology recipients but also technology suppliers. However, to the extent that the relevance of such a global framework will be determined by its adaptability to an ever-changing technological environment, it is important that it should take into account the major changes that have been described in this study and at the same time provide for the necessary normative flexibility and institutional follow-up to be able to accommodate further changes and to be continuously enriched by the fast growing national and international experience in this field.

95. The nature and contents of the draft international code of conduct reflect concerns and policy approaches existing at the time of inception of the negotiations. As shown in this study, these concerns and approaches have since then undergone some changes. For example, in developed market-economy countries, competition rules related to licensing agreements were at the time

relatively strictly applied in view of the prevailing doctrines regarding the patent/anti-trust interface. Such rules were also one main source of inspiration for the controls on restrictive practices adopted in the domestic legislation of developing countries. However, in recent years a radical change of attitude towards the application of competition rules to licensing arrangements has occurred in developed countries, while in many developing countries liberalization and relaxation measures have been adopted.

96. Moreover, when the code negotiations started, the activities of transnational corporations, including the terms and conditions underlying technology transfer arrangements, were viewed in most developing countries with strong suspicion and distrust. Thus, a relatively high tension prevailed in the relations between such enterprises and host Governments. This was reflected in the widespread use of control and screening mechanisms in the areas of foreign investment and technology transfer. More recently, in a number of developing countries there has been a shift towards promotional policies aimed at attracting more foreign investment and technology transfer and encouraging the economic activities of transnational corporations in such countries. These policy shifts, as well as the changes in enterprise strategies examined in this study, are of direct relevance to the nature and contents of the draft code of conduct and will undoubtedly affect the outcome of the negotiations.

97. As noted earlier, the negotiations on an international code of conduct on the transfer of technology were launched by the United Nations General Assembly in the context of its Programme of Action for the Establishment of a New International Economic Order (resolution 3202 (S-VI)). The General Assembly called for the adoption of an international code of conduct responsive to the needs of developing countries. Thus, the code was initially conceived to deal with an important aspect of North-South economic relations, namely technology transfer. However, it was soon decided that its character and application should be universal.

98. The need for a universally applicable instrument was suggested by the UNCTAD secretariat on the following grounds: (i) the nature of technology and the technology transfer process, which is not confined within national boundaries; (ii) the limitations of purely national action; (iii) the possibilities of jurisdictional conflicts of contractual interpretation arising from the proliferation of different national laws and regulations affecting technology transfer; (iv) the adverse effects of a lack of clear and internationally acceptable legal norms on the orderly flow of technology among nations; and (v) the need to accelerate international technology transfer, especially to developing countries, through concerted international action.

99. All regional groups of States in UNCTAD agreed that an international code of conduct could be a useful instrument to facilitate and promote the transfer of technology process; to reconcile differences in the approaches and experiences of countries concerning the transfer of techology; to give guidance and provide a framework for national legislation in the field of technology transfer and thus further the convergence of national laws; and to remedy abusive or anti-competitive practices in transfer of technology agreements.

100. These concerns and motivations are reflected in the preamble and chapter 2 (objectives and principles) of the draft code of conduct. They have also found concrete expression in the structure and coverage of the draft code, which has as its centre-piece the provisions addressed to parties to transfer of technology agreements contained in chapters 4 and 5, dealing respectively with restrictive practices and responsibilities and obligations of parties to technology transfer agreements. More importance has in fact been attached during the negotiations to the elaboration of chapter 4 (on restrictive practices) rather than of chapter 5 (responsibilities and obligations of parties) because the former expresses the primary concern of developing countries' technology legislation at that time with the control of abusive or restrictive practices. Developing countries' concerns with the international "legitimization" of their technology transfer legislation are particularly reflected in chapter 3 on national laws, while chapter 9 (on applicable law and dispute settlement) was mainly intended to prevent the evasion of the technology transfer laws of recipient countries through reference to a foreign law or forum. All these characteristics indicate the extent to which the orientation of the code provisions was influenced by the legislation existing at the time in developing countries and by the conceptual approaches to international technology transfer which prevailed in many countries during that period.

101. The draft code also reflects a detailed regulatory approach which might have been motivated at the time by the lack of knowledge in developing countries of the intricacies of contractual agreements on transfer of technology and supply of industrial works. Thus, the objective was to have an instrument which could also serve as a legislative and contractual guide for developing countries. Though not yet finalized, the draft code of conduct has indeed fulfilled this role in many respects, particularly through the pedagogical effect of the negotiations and as a source of inspiration for national legislation in many instances. However, it should be noted that some developing countries have also gained a lot of experience in the field since the 1970s and that the negotiating ability and the bargaining power of their enterprises has greatly improved. This has of course depended upon the capacities of the firms involved and the level of development of acquiring countries.

102. Thus, although the basic concerns which inspired the structure and coverage of the draft code may still exist, other needs and concerns, which may have to be taken into account, have also emerged in recent years. These include the growing collaboration among enterprises and between enterprises and Governments to promote technological innovation, the need to take advantage of opportunities to enter into strategic alliances, the increasing emphasis in government policies on attracting foreign investment and promoting technology transfers, the relaxation of controls on restrictive practices, the protection and licensing of new technologies, the increasing concerns about the impact of technology upon the environment, health or safety, and the growing accent on advisory services and assistance for local enterprises to ensure better selection and absorption of technologies. There is also clearly wider scope for participation in technological co-operative schemes financed by Governments and the establishment of joint ventures on research and development.

103. The draft code of conduct would also need to reflect recent technological developments, in particular the new methods of protection of such technologies and the emerging practices relating to their assignment and licensing. Specific reference would need to be made to methods for the assignment, sale or licensing of software, integrated circuits and other new forms of intellectual property rights. Similarly, the specific rules developed in national laws to regulate the assignment, use or licensing of new technologies would need to be taken into account.

104. The protracted negotiations on the code have seen an evolution in the positions of all regional groups in respect of the scope and contents of the code provisions. This evolution is reflected in the efforts made to balance competing interests throughout the text of the code. However, the need to strike a proper balance between private party autonomy and public interest has proved a major stumbling block throughout the negotiations in various parts of the text of the code, particularly chapters 4 and 9. This was mainly due to the divergent conceptual approaches with respect to technology transfer agreements adopted by different regional groups. It was also substantially influenced by the existence, on the one hand, of national legislation emphasizing the control and screening of such agreements to safeguard public interest and, on the other hand, of liberal régimes viewing such intervention as a disincentive to the process of technology transfer. Recent legislative developments in various countries described in this study might, however, contribute to a narrowing of the gap in conceptual approaches.

105. Other elements susceptible of reconciling similar past differences might also be found among the legislative and policy developments arising from the changes described in the study, as well as from the broader changes which have occurred in respect of international economic relations. All of them will need to be properly utilized to bring the code negotiations in line with the present realities on international technology transfers, so as to facilitate the achievement of a common understanding of the rules and principles which should serve as a basis for international co-operation in this domain.

Notes

1/ See National Science Foundation, International Science and Technology Data Update: 1988 (Washington D.C., U.S. Government Printing Office, 1989).

2/ See UNCTAD secretariat reports "The role of R and D institutes in technological innovation in the food processing industry in Senegal" (UNCTAD/TT/93) and "The role of R and D institutes in technological innovation: A case study of Sri Lanka" (UNCTAD/TT/95). For the situation in Latin America, see Carlos Aguirre, "Vienna ten years later: an assessment of science and technology in Latin America and the Caribbean" (Lima, 1989).

3/ See F. Lunzer, "Cash crisis creates biotech alliance", High Technology Business, April 1988, pp. 18-23.

4/ See OECD, Main Science and Technology Indicators, 1981-1987 (Paris, 1988).

5/ See National Science Foundation, International Science and Technology Data Update: 1988 (Washington D.C.: U.S. Government Printing Office, 1989).

6/ See R.T. Yuan, "The Biotechnology Potential", East Asian Executive Reports, August 1988, pp. 8-17.

7/ See U.S. Department of Commerce, U.S. Direct Investment Abroad 1982: The Benchmark Survey (Washington D.C.: U.S. Government Printing Office, 1985).

8/ See UNCTAD, "Recent trends in international technology flows and their implications for development" (TD/B/C.6/145).

9/ See resolution 33 (III) adopted at the third session of the United Nations Conference on Trade and Development in 1972.

10/ Between the fourth and fifth sessions of the Conference, an Interim Committee of the Conference established to seek solutions to the outstanding issues also held three sessions.

11/ See UNCTAD, "Draft international code of conduct on the transfer of technology" (TD/CODE TOT/47).

12/ See "Background note prepared by the UNCTAD secretariat" (TD/CODE TOT/49), "Report of the Secretary-General of UNCTAD on the consultations held pursuant to General Assembly resolution 41/166 of 5 December 1986" (TD/CODE TOT/51) and "Reports and notes by experts on the outstanding issues" (TD/CODE TOT/52).

13/ See the reports by the Secretary-General of UNCTAD in documents TD/CODE TOT/50, TD/CODE TOT/51 and TD/CODE TOT/53.

14/ See Special Report, "Computers at work", Asian Business, December 1984, pp. 38-58, and K.H. Poh, "NC applications - its present and future in Singapore's industries", International Journal of Operations and Production Management, vol. 4 (1), 1984, pp. 12-17.

15/ See Asian Business, December 1984, pp. 38-58, and A.Y.C. Nee and S.L. Long "Microcomputer-aided material management in a furniture factory", Computers in Industry, vol. 10 (4), 1988, pp. 221-229.

16/ See Trade and Development Report 1987 (UNCTAD/TDR/7), part II, and K. Hoffmann and R. Kaplinsky, Driving Force: The Global Restructuring of Technology Labour and Investment in the Automobile and Components Industries, (Westview Press, Boulder, Co., 1988).

17/ See International mergers and competition policy (OECD, Paris, 1988), and Commission of the European Communities, Seventeenth Report on Competition Policy (Brussels, Luxembourg, 1988).

18/ See F. Contractor and P. Lorange, "Why should firms co-operate? The economics and strategy rationales for cooperative ventures?" in Cooperative Strategies in International Business (Lexington M.A., Lexington Books, 1988).

19/ See Robert Sherwood, "A new theory of conductivity. The impact of weak intellectual property protection on technology transfer", paper presented to TIES meeting, Lima.

20/ See R.E. Berenbeim, Safeguarding Intellectual Property (New York, The Conference Board, 1989).

21/ See Robert Brainard, "Science in the Market", OECD Observer, No. 151, April/May 1988; and Georges Femé, "La science, une nouvelle marchandise", La Recherche, No. 208, March 1989.

22/ See J. Kerr, "Management's new cry: fight for your technology rights", Electronic Business, 15 August 1988, pp. 44-48.

23/ See Brazil, Jornal do Comercio, 15 August 1989.

24/ See A. Mody, "New environment for intellectual property", Working Paper, World Bank Industry and Energy Department, June 1989.

25/ See I.C. Magaziner, and M. Patinkin, "Fast heat. How Korea won the microwave war", Harvard Business Review, January/February 1989, pp. 83-92.

26/ Between 1985 and 1988, the number of contracts for the supply of electrical equipment and communications registered by the Brazilian authorities grew from 26 to 126. Source: Directoria de Contratos (DIRCO), Instituto Naçional de la Propiedade Industrial (INPI), Brazil, 1989.

27/ See F. Contractor, "Ownership patterns of U.S. joint ventures abroad and the liberalization of foreign government regulations in the 1980's: Evidence from the benchmark surveys", Journal of International Business Studies (forthcoming).

28/ See ECE, East-West Joint Ventures News, No. 1, 1989, p. 5.

29/ See "Investors welcome", Financial Times, 8 December 1989.

30/ See ECE East-West Joint Ventures News, No. 2, July 1989, p. 10

31/ See "Moscow threatens joint venture clamp-down", Financial Times, 1 February 1990.

32/ See G. Vickery, "A survey of international technology licensing", STI Review, December 1988, pp. 7-29.

33/ See Hee Yol Yu, "Joint ventures as a channel for the transfer of technology in the Republic of Korea" in "Joint ventures as a channel for the transfer of technology" (UNCTAD/ITP/TEC/9).

34/ The "product-in-hand" contract involves the supplier's continued responsibility for operating the plant and providing training for a specified period, while the "quality-in-hand" contract involves a trademark licence as well. Other forms include the "cost plus fee" (where the supplier is reimbursed the cost of setting up the plant and paid a separate fee), the "market-in-hand" and the "profit-in-hand" contracts.

35/ See Mody, op.cit..

36/ See footnote 32 above.

37/ Survey by F. Contractor, quoted in OECD, Competition Policy and Intellectual Property Rights (Paris, 1989).

38/ See J. Maciejewicz, Polska w MI/CKK, (177), 1988, p. 8, and R. Rapacki, "Wyniana licencyna Wschodzachad Przyczynek do teorii", SGPS pp. 167-173, University of Economics, Warsaw, 1986.

39/ See White and Campos, "Alternative technology sources for developing countries: the role of small and medium-sized enterprises from industrialized countries" (CEDREI, Buenos Aires, 1986).

40/ See Kerr, op.cit. and G.M. Hoffman, in J. Osepchuk, ed. "A written panel discussion on patent issues", IEEE Technology and Society, September 1988, pp. 14-21.

41/ See the United States Justice Department's "Vertical Restraint Guidelines" of 23 January 1985, "Mergers Guidelines" of 1984, "Antitrust Enforcement Guidelines for International Operations 1989", and the EEC Council Regulation No. 1448/89 on the control of concentration between undertakings.

42/ All three countries maintained controls on technology importation well into the 1980s. Japan adopted new "Administrative Guidelines on Regulating Unfair Trade Practices in Technology (Patent and Know-how), Licensing Contracts" on 15 February 1989, which now apply to both foreign and domestic transactions.

43/ See Tech Europe, March 1990, III.8, Europe Information Service, Brussels.

44/ See the amendments to the United States Export Administration Act by the Omnibus Trade and Competitiveness Act of 1988.

45/ See, for example, the United States Public Law 96-517 of 12 December 1980, amending Title 35 of the Code on Patents.

46/ See "Czechoslovakia to ease curbs on joint ventures", Financial Times, 12 January 1990.

47/ See "Moscow plans joint venture 'Tecnopark'", Financial Times, 13 February 1990.

48/ See "Moscow aims to set up Malaysian joint ventures", Financial Times, 13 February 1990.

49/ See "Mexico to improve patent protection", Financial Times, 22 January 1989.

50/ See "Chile surrenders to U.S. threat on pharmaceutical patents", Financial Times, 1 February 1989.

51/ See UNCTAD secretariat report "The implementation of transfer of technology regulations: A preliminary analysis of the experience of Latin America, India and the Philippines" (UNCTAD/TT/32), Nigeria (UNCTAD/TT/74), Portugal (UNCTAD/TT/73), the Republic of Korea (UNCTAD/TTP/TEC/6); and Brazil (forthcoming).

52/ See, for example, Yugoslavia's "Law on Long-term Co-operation, Business and Technical Co-operation, and the Acquisition and Assignment of Material Rights to Technology between Organizations of Associated Labour and Foreign Persons", 1978.

53/ See, for example, Brazil's Normative Act 64 of 1983.

54/ See Argentina's "Resolution No. 264, Guidelines for the Transfer of Technology of 27 March 1981", Mexico's "Regulations for the Law on the Control and Registration of the Transfer of Technology and the Use and Exploitation of Patents and Trademarks" of 9 January 1990 and Nigeria's "Guidelines to assist Nigerian entrepreneurs while negotiating technology transfer agreements".

55/ In Brazil, for example, a system of notification has been established for contracts entered into by enterprises with approved Programmes of Industrial Development. See also Decision 220 of the Andean Pact; and Colombia's Decree 1265 of 1987, Ecuador's Decree 3095 of 1987 and Mexico's new Regulations.

56/ See Law No. 22426 of 12 March 1981.

57/ See section 32 of the Antimonopoly Act of Japan.

58/ See the Act against restraints of competition of the Federal Republic of Germany, which inter alia exempts restrictions necessary for technically satisfactory exploitation, price fixing, reciprocal grant-back, no challenge clauses and market restrictions. Other restrictions may also be authorized if the freedom of economic action of the acquirer is not unduly restricted, or if competition is not substantially impaired.

59/ See the United States Department of Justice's "Antitrust Enforcement Guidelines for International Operations" of 10 November 1988 (DOC Guidelines).

60/ See Aff. Consorzio Italiano c/ Régie Renault, 53/87, 5/10/88; Aff. Société Volvo c/ Eric Veng (U.K.) Ltd. 238/87, 5/10/88.

61/ See Aff. Pharmon c/ Hoechst AG, 19/84, 9/7/87 and Aff. Firme Electrola Gmbh c/ Firme Patricia Imoff 361/87, 24/1/89.

62/ See OECD, Competition Policy and Intellectual Property Rights, (Paris, 1989).

63/ See DOJ Guidelines, as well as the Department of Justice's "Vertical Restraint Guidelines" of 23 January 1985.

64/ See United States Department of Justice's "Antitrust Enforcement Guidelines for International Operations" of 26 January 1977.

65/ Recommendation of the Council Concerning Action Against Restrictive Business Practices Relating to the Use of Patents and Licences.

66/ See the United States National Cooperative Research Act of 1984.

67/ See United States v. Westinghouse Electric Corp. 648 U.S. 642, and OECD 1989, op.cit.

68/ See W.H. Chun, "Legal aspects of technology licensing in the Republic of Korea", Columbia Journal of Transnational Law, 1989, vol. 27, p. 53.

69/ See National Office on Industrial Property, Decree No. 70 of 24 September 1979.

70/ Guidelines on the Selection, Evaluation and Negotiation of Technology Transfer Arrangements, 1979.

71/ See Government of India, Guidelines for Industries, 1982.

72/ Zambia: Act No. 5, 1986, revising the Industrial Development Act No. 18/1977.

73/ Peru: Rules for establishing the precise rights and obligations of the licensors and licensees of foreign technologies, marks or patents of 23 October 1981.

74/ See Art. 3 of the Rome Convention on the Law Applicable to Contractual Obligations of 19 June 1980 (Journal Officiel des communautés européennes No. L266, 9 October 1980) and Art. 116 of the new Swiss Law on Private International Law.

75/ See Art. 7 of the Rome Convention and Art. 17 and 19 of the Swiss law. However, Art. 7 has not been agreed to by all signatory States of the Convention.

76/ See the Swiss Law, and Art. 4 of the Rome Convention.

77/ See the Austrian Law on Private International Law of 1978.

78/ See "Marriages of convenience", Financial Times, 29 May 1990, quoting the vice-president of an Italian computer company.

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ON TRANSFER OF TECHNOLOGY

FURTHER CONSULTATIONS ON A DRAFT INTERNATIONAL CODE OF CONDUCT ON THE TRANSFER OF TECHNOLOGY

Report by the Secretary-General of UNCTAD

Attached is the report by the Secretary-General of UNCTAD on the above subject, as submitted by the General Assembly at its forty-fifth session.

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DEVELOPMENT AND INTERNATIONAL ECONOMIC CO-OPERATION:
TRADE AND DEVELOPMENT

Negotiations on a draft international code of conduct on the transfer of technology

Report of the Secretary-General of the United Nations Conference on Trade and Development

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I. INTRODUCTION

1. Formal initiatives with a specific reference to the formulation of an international code of conduct on the transfer of technology started in 1972. 1/ However, the main impetus to the negotiations was provided by the General Assembly at its sixth special session in 1974, when it called for the formulation of an international code of conduct on the transfer of technology, corresponding to the needs and conditions prevalent in developing countries (see General Assembly resolution 3202 (S-VI), sect. IV). At its seventh special session, the Assembly adopted by consensus resolution 3362 (S-VII), providing that all States should co-operate in evolving a code of conduct, corresponding, in particular, to the special needs of the developing countries. An intergovernmental group of experts was established by the United Nations Conference on Trade and Development (UNCTAD) for this purpose and held six sessions between November 1976 and 1978. Subsequently, by its resolution 32/188 of 19 December 1977, the General Assembly decided to convene a United Nations Conference on an International Code of Conduct on the Transfer of Technology under the auspices of UNCTAD, to negotiate on the draft elaborated by the expert group, and to take all decisions necessary for its adoption. Since 1978, six sessions of the Conference have been held, the last of which was from 13 May to 5 June 1985.

2. The negotiations so far 2/ have led to a structure of the draft code, consisting of a preamble and the following nine chapters: chapter 1. Definitions and scope of application; chapter 2. Objectives and principles; chapter 3. National regulation of transfer of technology transactions; chapter 4. Restrictive practices; chapter 5. Responsibilities and obligations of parties to transfer of technology transactions; chapter 6. Special treatment for developing countries; chapter 7. International collaboration; chapter 8. International institutional machinery; and chapter 9. Applicable law and settlement of disputes. The substantive provisions of the code may be divided into those addressed to Governments (chaps. 3, 6, 7 and 8); and those addressed to parties (chaps. 4, 5 and 9). Most of the provisions of the draft code have been agreed upon, except for a few issues to be found in chapters 4 and 9.

3. With respect to chapter 4 of the draft code, there is a general understanding that it should consist of a chapeau and a list of specific practices to be avoided by parties to transfer of technology transactions. The drafting of clauses relating to 11 of these practices has been concluded, while the final formulation of three further clauses relating to grant-back provisions, export restrictions and restrictions after the termination of arrangements, remains outstanding. The formulation of the chapeau poses the problem whether, and if so in which way, the following four aspects should be included in the code: (a) the characterization of the practices to be avoided and the circumstances under which they should be avoided; (b) the criteria to be followed by parties or by competent authorities in the determination of whether a practice is restrictive or not for the purpose of the code; (c) the applicability of chapter 4 provisions to the transfer of technology transactions between related parties (affiliated enterprises); and (d) the relationship between the code provisions and applicable national or regional legislation.

4. The text of chapter 9 on applicable law and dispute settlement has not yet been formally drafted. However, the various texts considered during the negotiations consist of provisions dealing with choice of law, conciliation and arbitration. It appears that there is a broad consensus on the formulation of the provisions on conciliation and arbitration, but there are differences in the approaches proposed by regional groups with respect to the provision on the choice of law.

5. The other issues still outstanding are the definition and underlying concept of the term "international transfer of technology transactions" in chapter 1, the scope and duration of confidentiality obligations in chapter 5, the nature of the institutional machinery to be established within UNCTAD to deal with certain provisions relating to the code, and the nature and mandate of the review Conference, in chapter 8. For all these topics, compromise proposals have been submitted that seem to be close to resolving the outstanding questions.

6. Although the above paragraphs summarize the formal position relating to the issues outstanding in the draft code of conduct, the protracted negotiations have resulted in their being influenced by a number of factors in the external environment and have sometimes led to a questioning of some agreed provisions and even the relevance of some others.

II. CONSULTATIONS BY THE SECRETARY-GENERAL OF THE UNITED NATIONS CONFERENCE ON TRADE AND DEVELOPMENT AND THE PRESIDENT OF THE UNITED NATIONS CONFERENCE ON AN INTERNATIONAL CODE OF CONDUCT ON THE TRANSFER OF TECHNOLOGY

7. Since the last session of the Conference, pursuant to General Assembly resolution 40/184 of 17 December 1985, followed by Assembly resolutions 41/166 of 5 December 1986 and 42/172 of 11 December 1987, Assembly decision 43/439 of 20 December 1988, and Assembly resolution 44/216 of 22 December 1989, the Secretary-General of UNCTAD and the President of the United Nations Conference on an International Code of Conduct on the Transfer of Technology have held consultations with regional groups and interested Governments with the objective of delineating the scope of the issues outstanding in the draft code and undertaking a quest for appropriate solutions. Significant efforts have been made by all regional groups and interested Governments to overcome the differences in their respective approaches to the issues outstanding in the code, particularly in chapters 4 and 9. However, despite all efforts, no concrete results enjoying general consensus have so far emerged. 3/

8. As pointed out in the report of the Secretary-General of UNCTAD to the General Assembly at its forty-fourth session (A/44/554), in the context of consultations carried out in 1989, the Secretary-General of UNCTAD, taking into consideration the views expressed by the member States and regional groups participating in the consultations, communicated to the regional groups on 9 February 1989 the way in which the Secretary-General of UNCTAD, in collaboration with the President of the Conference, intended to proceed, including the practical steps to be taken in the framework of these consultations. These steps were as follows:

(a) The secretariat of UNCTAD would prepare a study on the relevance of recent policy and legislative developments in the area of technology to the draft code of conduct, particularly the issues outstanding in the negotiations, and circulate it to Governments for comments;

(b) The Secretary-General of UNCTAD and the President of the Conference would assess the situation, based on the outcome of (a), and with the assistance, where appropriate, of experts in the field of technology, and consider it in their consultations with regional groups and Governments;

(c) The Secretary-General of UNCTAD would then make a report to the General Assembly based on (a) and (b) to enable the Assembly to take appropriate action on the negotiations on the draft code of conduct at its forty-fifth session.

9. General Assembly resolution 44/216 took note of the above-mentioned report (A/44/554) and invited the Secretary-General of UNCTAD to submit to the Assembly at its forty-fifth session a complete report, based on the outcome of consultations, so as to enable the Assembly to take appropriate action on the negotiations on the draft code of conduct. The above-mentioned study by the UNCTAD secretariat has now been completed 4/ and distributed to regional groups. During 1990, the Secretary-General of UNCTAD has continued his consultations with regional groups and interested Governments. At the time of writing the present report, these consultations are still going on and the Secretary-General of UNCTAD expects to supplement the present report with an oral account to the General Assembly of the latest developments.

III. RECENT CHANGES IN THE AREA OF TECHNOLOGY AND THEIR RELEVANCE TO THE DRAFT CODE OF CONDUCT

10. The findings of the study carried out by the UNCTAD secretariat confirm that important changes in the area of technology have occurred since the start of the negotiations on the draft code of conduct. Major technological advances in such fields as informatics, telecommunications, biotechnology and new materials have had or are likely to have a strong influence on the production of goods and services. Such advances have occurred mainly in the developed market-economy countries, resulting in a further widening of the technological gap among countries, particularly between the developed and the developing countries. The resultant research and development gap would need to be compensated for by increased international transfers of technology. However, there has been a growing concentration and collaboration among allied enterprises in developed market-economy countries, which may, to the extent that it excludes enterprises from developing countries, result in a reduction of sources of supply of technology (particularly new technologies) for these countries. It would further reinforce the bargaining power of technology suppliers, thus making it more difficult for technology acquirers, particularly in less technologically advanced countries, to obtain fair and equitable terms in technology transfer transactions. However, these trends should be set against other factors such as the greater incentive to transfer technology provided by higher research and development costs and faster innovation, the increase in the involvement of small and medium-sized enterprises

in international technology transfer and the growing ability of developing country enterprises to engage in such transfers.

11. Technological developments have also given rise to a growing emphasis on stronger protection of intellectual property rights and an increased resort to trade secrecy by technology creators and suppliers. The strategies of developed market-economy enterprises in this respect have often received the support of their Governments, both through national measures to provide stronger protection and through related international initiatives. Indeed, there appears to be a widespread tendency for Governments world wide to grant stronger intellectual property protection. Although the granting of higher standards of protection may be justified on grounds of providing incentives and securing investment returns for technology creators and innovators, other effects which may ensue from it, particularly in respect of international transfer and diffusion of technology, should not be overlooked; such effects would include stronger incentives to maintain import monopolies rather than to work or license the technology locally, higher royalties and more restrictive practices in licensing contracts. On the other hand, given the importance attached by suppliers to the protection régimes of potential recipient countries, there is evidence that stronger protection could lead to greater willingness to transfer technology, particularly new technologies. However, although stronger protection may be considered a necessary condition for greater transfer, particularly of more advanced technologies, it is far from being a sufficient condition, given the importance of several other factors.

12. There has also been a universal trend towards liberalization of controls on restrictive practices in technology transfer transactions. In developed market-economy countries, this has manifested itself, inter alia, in greater reliance upon the doctrine of the rule of reason. In developing countries, there has been a relative shift from concerns relating to the adverse effect of restrictive practices on the quality of technological acquisition and diffusion, to concerns about the perceived "disincentive" effects of controls upon the quantity of technology acquired. There has also been a realization that a "good" contract from the legal and cost point of view does not necessarily ensure proper technology transfer and assimilation. It is possible that stronger protection for technology and the liberalization of controls on restrictive practices will result in the prevalence of more restrictive practices in technology transfer transactions. However, the fact that, in some developing countries, acquiring enterprises have learned to bargain better and now possess more knowledge of the technologies they require might partially help to offset this trend. It would, of course, depend upon the abilities of acquiring firms and the level of development of acquiring countries.

13. The economic and financial problems in many developing countries, the relative decline in technology flows to these countries and the importance attached to new technologies have led to much greater efforts by them to attract and promote technology transfer and foreign investment, which contrast with the greater regulation and control of such activities in the past. The range of new policy approaches adopted include more active search for and co-operation with potential foreign investors and suppliers; more investment incentives; and efforts to provide more advisory services to local enterprises in respect of selection of technologies

and suppliers and negotiation of contracts. This promotional approach has also aimed at encouraging foreign investment and transfer of technology by removing those policy elements perceived as disincentives by foreign partners. There has been a similar extensive liberalization of policies towards foreign investment in the countries of Eastern Europe. The overall policy trend is towards less control over foreign direct investment or over the contractual aspects of technology transfer, and more promotion and co-operation.

14. Indeed, a trend towards more co-operation in technology generation and transfer can be observed in all countries and at all levels. At the governmental level, a large number of bilateral agreements on science and technology, investment and double taxation have been concluded. As indicated above, co-operation among enterprises, especially in developed market economy countries, has also intensified. In technology transfer arrangements, there is now often closer involvement between suppliers and recipients, leading to more linkage of technical services with different channels and forms of transfer, and lesser reliance on arms'-length contractual forms such as vertical licensing or turn-key contracts. There is also more use of joint ventures and collaborative arrangements as channels for technology transfer.

15. The necessity to co-operate closely on technology matters appears to have increased world wide due to the growth in the cost of developing new technology, the difficulties in its appropriation, and the increased complexity of its transfer. Meanwhile, the need for technology transfer to developing countries has also intensified as a result of the widening of the research and development gap between them and developed countries, the resource constraints they face and the increasingly decisive importance of technology in economic development and international trade. Moreover, the recent international initiatives for strengthening the world-wide protection of intellectual property rights, in order to enable technology creators to better appropriate the fruits of their investment, have increased the immediate relevance and need for corresponding international action on the "dynamic" aspects of such appropriation, so as to facilitate the transfer and diffusion of proprietary technology in the wider interests of both suppliers and potential recipients. Such action would entail the elaboration of international rules and principles aimed at promoting co-operation, both at the governmental and enterprise levels, in the diffusion and transfer of technology. A universally applicable framework of rules and principles would not only bring about a more balanced approach to international technological co-operation, making it easier for technology acquiring countries to accept the granting of higher standards of protection, but would also enhance the predictability and transparency needed for the free flow of technology among nations, thus benefiting not only technology recipients but also technology suppliers. It would also be indicative of a willingness not to exclude the interests of any group of States in the context of efforts to establish universally applicable norms and standards in the area of technology.

16. As an attempt to elaborate a framework of rules and principles aimed at promoting international co-operation in the area of technology, the negotiations on an international code of conduct on the transfer of technology do not appear to have lost their intrinsic value to the international community. However, although

the basic concerns that inspired the structure and coverage of the draft code may still exist, the code negotiations would also need to take fully into account the needs and concerns which have emerged in recent years, and to reflect the important policy shifts which have taken place both in developed and developing countries with respect to foreign investment, competition law, intellectual property protection and technology transfer. These include the pressures towards stronger intellectual property protection, the growing technological collaboration among enterprises and between enterprises and Governments to promote technological innovation, the increasing emphasis in government policies on attracting foreign investment and promoting technology transfers, the relaxation of controls on restrictive practices, the protection régimes and licensing practices relating to new technologies, the increased concerns about the effects of technology upon the environment, health or safety, and the growing accent on advisory services and assistance to local enterprises to ensure better selection and absorption of technologies. There is also a need for a wider scope for participation of developing country enterprises in technological co-operative schemes and ir joint ventures on research and development. The taking into account of such changes may involve a relative shift in emphasis from the "control" approach, on which the code of conduct was to be based at the inception of the negotiations, to a "co-operative" approach capable of facilitating the flow of technology among nations, although there continues to be a need for both approaches in the code.

17. The protracted negotiations on the code have seen an evolution in the positions of all regional groups in respect of the scope and contents of the code provisions. However, the need to strike a proper balance between private party autonomy and public interest has proved a major stumbling block throughout the negotiations in various parts of the text of the code, particularly chapters 4 and 9. This was mainly owing to the divergent conceptual approaches with respect to technology transfer agreements adopted by different regional groups. Recent policy and legislative developments in many countries might, however, contribute to a narrowing of the gap in conceptual approaches. Other elements susceptible of reconciling similar past differences might also be found among the legislative and policy developments which have occurred, as well as from the broader changes in respect of international economic relations. All of them will need to be properly utilized to bring the code negotiations in line with the present realities on international technology transfers, so as to facilitate the achievement of a common understanding of the rules and principles that should serve as a basis for international co-operation in this domain.

18. The above-mentioned secretariat study 4/ was considered by a number of experts invited by the Secretary-General of UNCTAD to provide advice in their personal capacity on the nature and consequences of recent changes in the area of technology and their relevance to the code negotiations, and to suggest appropriate solutions to the issues outstanding, as well as any other possible ways of advancing the negotiations. The experts met at Geneva from 3 to 6 September 1990 and delivered a report to the Secretary-General of UNCTAD at the end of their meeting. The experts reaffirmed the continued relevance and utility of an international code of conduct on the transfer of technology. They were of the view that, in order to achieve conclusive results on the code negotiations, it was necessary to adapt the draft code of conduct to the important changes and developments that have occurred in

recent years in the area of technology. To this end, they have suggested some specific ideas and approaches that could be considered by Governments in any future action on the code negotiations. Concrete recommendations were also made in respect of the unresolved issues in the draft code of conduct. Relevant extracts from the experts' report to the Secretary-General of UNCTAD are set out in the annex to the present report.

IV. SUGGESTIONS BY THE SECRETARY-GENERAL OF THE UNITED NATIONS CONFERENCE ON TRADE AND DEVELOPMENT FOR FURTHER ACTION ON THE CODE NEGOTIATIONS

19. As noted above, the Secretary-General of UNCTAD is continuing consultations with regional groups and Governments regarding further action relating to the negotiations, using as a basis the findings and conclusions of the UNCTAD secretariat study, and the observations made by the experts. The Secretary-General will orally inform the General Assembly at its forty-fifth session of the outcome of these consultations.

Notes

1/ See resolution 33 (III) adopted at the third session of the United Nations Conference on Trade and Development in 1972.

2/ See UNCTAD document "Draft International Code of Conduct on the Transfer of Technology" (TD/CODE TOT/47).

3/ See the reports of the Secretary-General of the United Nations Conference on Trade and Development (TD/CODE TOT/50, TD/CODE TOT/51 and TD/CODE TOT/53).

4/ See UNCTAD document "The relevance of recent developments in the area of technology to the negotiations on the draft International Code of Conduct on the Transfer of Technology" (TD/CODE TOT/55) to be published shortly.

ANNEX

Extracts from the report to the Secretary-General of the United Nations Conference on Trade and Development of the informal expert group meeting on the draft international code of conduct on the transfer of technology

1. The study by the UNCTAD secretariat of recent developments in the area of technology and their relevance for the negotiations on an international code of conduct on the transfer of technology is a very useful review of the many changes that have occurred in the field of transfer of technology in recent years. It notes that major technological advances have occurred in such fields as informatics, telecommunications, biotechnology and new materials, and have had or are likely to have a strong influence on the production of goods and services. Such advances have occurred mainly in the developed market-economy countries, resulting in a further widening of the technological gap among countries, particularly between the developed and the developing countries.

2. Technological developments have also given rise to new methods of intellectual property protection, as well as to new practices in technology transfer arrangements. The strategies of developed market-economy enterprises in this respect have often received the support of their Governments, both through national measures to provide stronger protection and through related international initiatives. Indeed, there appears to be a widespread tendency for Governments world wide to grant stronger intellectual property protection. There has also been a universal trend towards liberalization of controls on restrictive practices in technology transfer transactions. In developed market-economy countries, this has manifested itself, inter alia, in greater reliance upon the rule of reason. In developing countries, a relevant factor behind this trend has been a relative shift from concerns relating to the adverse effect of restrictive practices on the quality of technological acquisition and diffusion, to concerns about the perceived "disincentive" effects of controls upon the quantity of technology acquired.

3. The economic and financial problems in many developing countries, the relative decline in technology flows to most of these countries and the importance attached to new technologies have indeed led to much greater efforts by them to attract and promote technology transfer and foreign investment, which contrast with the greater regulation and control of such activities in the past. The range of new policy approaches adopted include more active search for and co-operation with potential foreign investors and suppliers; more investment incentives; and more advisory services to local enterprises in respect of selection of technologies and suppliers and negotiation of contracts. This promotional approach has also aimed at encouraging foreign investment and transfer of technology by removing those policy elements perceived as disincentives by foreign partners. There has been a similar extensive liberalization of policies towards foreign investment in the countries of Eastern Europe. The overall policy trend is towards less control over foreign direct investment or over the contractual aspects of technology transfer and more promotion and co-operation.

4. Indeed, a trend towards more co-operation in technology generation and transfer, motivated by considerations of the increasing cost and complexity of technology, can be observed in all countries and at all levels. At the governmental level, a large number of bilateral agreements on science and technology, investment and double taxation have been concluded. Co-operation among enterprises, especially in developed market economy countries, has also intensified leading, inter alia, to more use of joint ventures and collaborative arrangements as channels for technology transfer.

5. The findings summarized above indicate that recent economic, technological and policy developments have rendered even more relevant concerted international action on the creation of a global framework of norms and standards on the transfer of technology. However, for the negotiations initiated in the 1970s to formulate an international code of conduct on the transfer of technology to serve as such a global framework, the important changes described in the study will have to be taken into account. This is all the more important because, although the code of conduct may still be considered a useful and relevant instrument, the demand for it appears to have weakened during the last few years. Nevertheless, the code could still continue to fulfil a useful function. First, it would serve as a framework for international co-operation in the area of transfer of technology. Secondly, it would provide guidelines for national legislation and for contractual relationships regarding transfer of technology. Thirdly, the adoption of multilaterally-agreed rules on restrictive practices in transfer of technology transactions would help to control abuse of market power, especially in the context of stronger protection of intellectual property rights. It would be particularly useful in view of the fact that national rules relating to competition would not normally apply to behaviour by enterprises that has no effect on the domestic market. Fourthly, it would be of help to developing countries that at present have no competition rules in the field of transfer of technology or similar rules for the control of abusive practices in licensing agreements.

6. Moreover, the relevance of a code of conduct on the transfer of technology has been further enhanced by recent international initiatives in closely related areas, such as those on trade-related aspects of intellectual property rights and on the access to and transfer of environmentally sound technologies to developing countries.

7. In order to adapt the draft code to the important changes and developments that have occurred in recent years, consideration should be given to the following approaches:

(a) In future code negotiations, the mutuality of interests between parties to transfer of technology transactions, as well as Governments, should be stressed;

(b) Although there is need for both "control" and "co-operative" provisions in the code, more emphasis is called for, at the present stage, on co-operation and promotion of technology transfer, which could be manifested by more specific rules on intergovernmental and inter-enterprise co-operation on, inter alia, collaborative research and development schemes or programmes, joint ventures, and the promotion of innovation in the least developed countries. In this context,

specific programmes could be elaborated to enable countries to benefit from international technological co-operation;

(c) The main thrust of the code provisions relating to the conduct of parties should be the control of the abuse of economic power. It should lay down basic principles of competition (anti-trust) in the area of licensing and technology transfer;

(d) It should be clarified that the scope of application of the code would cover new technologies and new forms of technology transactions, such as those relating to biotechnology, computer software and layout-designs of integrated circuits. Illustrations of channels and contractual forms, such as joint ventures that may possibly be used for such transfer of technology, should also be provided;

(e) Both the universal applicability and North-South character of the code should be maintained. Additional support could be given to developing countries to strengthen the bargaining power of their enterprises;

(f) Consideration should be given to the possible extension of the code provisions to cover: (i) environment; (ii) safety of products and processes; and (iii) consumer interest.

8. In case there is no agreement on the incorporation of the above suggestions in the draft code of conduct, the following options may be considered in order to conclude the negotiations:

(a) The possibility of adopting a set of agreed rules and principles consisting of those provisions of the draft code relating to the conduct of parties to transfer of technology transactions (in particular, chaps. 4 and 5);

(b) A code consisting of the agreed provisions of the draft code of conduct;

(c) Further attempts to resolve the outstanding issues in the draft code resulting in the adoption of the code as presently structured.

9. In chapter 3, consideration should be given to a more precise reflection of the reference to international law in the text.

10. In the search for a solution to the issues outstanding in chapter 4, a distinction should be made between the chapeau and the individual provisions: (a) with regard to the chapeau, a reference to the restrictive business practices code should be a useful basis, taking into account the specificities of the transfer of technology transactions. Unlike other chapters of the code, chapter 4 need not apply to conduct between parent and subsidiary; (b) the 14 provisions on individual practices should be maintained for further consideration, taking into account recent trends relating to the greater use of the rule of reason as a yardstick in the treatment of individual restrictive practices. While the competition test could provide a substantial basis for dealing with the overall problems in chapter 4, it is recognized that the development test has a role to play in national laws, especially as regards the control of other practices that may affect the technological development of developing countries.

11. In chapter 5, the concept of confidentiality contained in the proposal by the President of the Conference appears to be appropriate.

12. With regard to applicable law in chapter 9, the following options should be considered: (a) the omission of the provision on applicable law (9.1); (b) the concept contained in the proposal by the President of the Conference could be retained; (c) further consideration could be given to the proposals by the regional groups.

13. If the approaches for further consideration of the code suggested above were to be retained by Governments, there might be a need for a preparatory process before resuming negotiations on the code.

14. To that end, it is recommended that the UNCTAD secretariat undertake further studies on some of the specific issues mentioned above in order to facilitate their consideration by Governments. Such studies should, inter alia, examine the recent changes in competition law and policy and their relevance to the restrictive practices covered by the draft code and the modalities of licensing and transfer of technology in the areas of biotechnology and computer technology.